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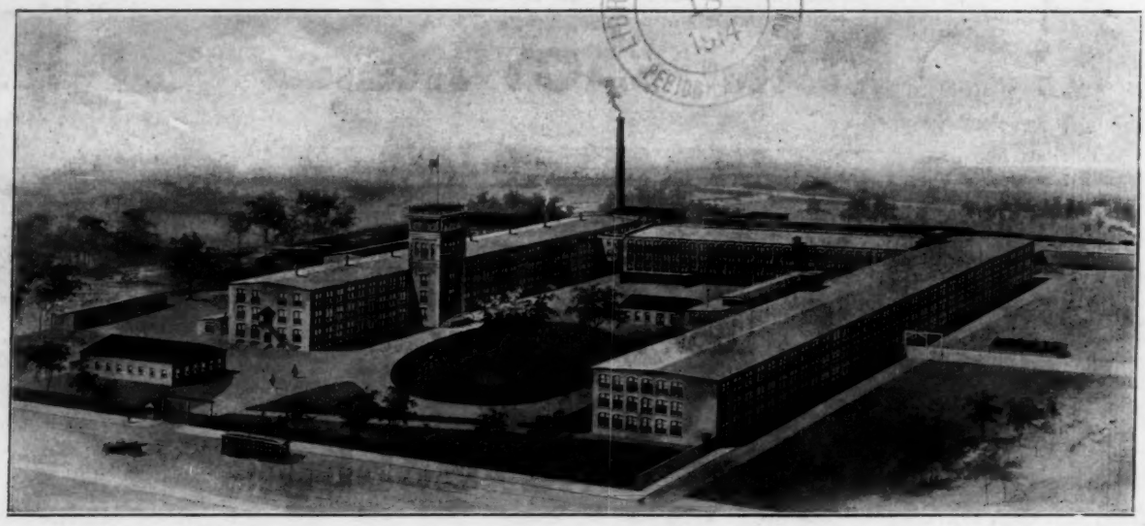

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HARMONY.

According to Webster, harmony means "agreement in relation." But harmony is deeper and more essential than agreement. We may have a superficial, forced or patched-up agreement, but never a superficial, forced or patched-up harmony. Harmony must be the real, genuine article in order to be of actual value to the manufacturing plant.

In this respect, at least, a business organization can be compared to an army. Harmony is one important thing that helps to measure the quantity of success of either an army or a business organization. Every branch or department of any business must be in perfect harmony with every other branch or department in order to get all the success there is to be had. The management should bear this fact in mind and exert every possible effort to attain such a desirable condition.

The dominant idea should be to keep before all employees, from the highest to the lowest, the paramount fact that the welfare of the firm is the important thing for all to bear in mind. There are, of course, firms who get along successfully for a time without having full harmony between the various branches, but if this is allowed to continue, the success will be reduced even if it does not entirely wreck the business.

A change of any kind, whether of manufacturing or selling, must be considered from every standpoint. While such a change may reduce to the minimum the costs in one department, it may at the same time be placing the maximum of cost on another department, in which case, perhaps, it should not be made. Except in unusual cases, all changes should be for the common good, and no one person in any business should be allowed to become so self-centered that he only considers his own position and bends all efforts to make his own work easy of accomplishment, while adding to the work of some other person.

In opposition to this it might be said that the manager can see if such things are happening and immediately check them, but in some cases it may not be quickly noticeable. Such methods will creep into the best of plants, and sometimes talking about eliminating abuses is much easier than accomplishing the feat.

Harmony in this sense is in reality shop loyalty. The greatest temptation for any manager, when he sees an opportunity to make a change which seems to be for the betterment of the business, is to order that change on the supposition that he alone is responsible if it does not work well. If, however, the change is carefully explained to his subordinates, what might otherwise have proven a failure is often made a big success. By taking the department heads into his confidence he makes the intended change a concerted action, and if there is any shop loyalty it will help to make the new method succeed. If these department heads have not had an opportunity to become part-

ners in this change by being taken into the manager's confidence, it is only natural that they will be somewhat dubious about its success, and also they will not have the same personal interest as an incentive for them to work hard to make it succeed as if they thought its success depended largely on their personal efforts. If they know of it before it is tried they will feel that their cooperation will be appreciated and the vanity which it instills will induce them to put in some extra effort to make it go.

In this respect a certain mill can be recalled where it was decided to make another article and add it to the regular line manufactured. Every one familiar with this mill's business said it would not succeed. The management, however, called together all the traveling representatives (the company sold direct) and told them what was to be tried. They were told that it was directly up to them whether the new departure would be a success or not. If they would sell enough of the new product it would be a success, if not it must be a failure. It all depended on them. The salesmen started out with the feeling that it depended on them, and being loyal to the company, the efforts they made were so successful that more goods were sold than the mill could handle in that particular line.

Two departments of any business that should get to working harmoniously are the two main ones, namely, the manufacturing and the selling departments. The manufacturing department often think that whatever they can make should be sold, and the selling department think that whatever they can sell should be made. This is good logic, perhaps, but it is possible that a concern is not equipped to make all of the goods that can be sold, or that they do not cover the territory where there is a sale for the goods that the manufacturing department thinks it desirable to make. Therefore, these two departments must be in complete accord.

However, the question of harmony between the separate departments that go to make up the manufacturing department should receive the greatest amount of attention from the readers of COTTON. This part of the subject is of greater interest to them because separate parts or all of such departments are in their charge. The success or failure of the business is largely if not almost entirely in the hands of the superintendent and his assistants. With an experienced superintendent, assisted by competent overseers, there is bound to be success if they work in harmony with each other. In this sense harmony is synonymous with cooperation or team work.

Perhaps the best illustration of harmonious action being of benefit is seen in a baseball league. If there is one team composed of nine individual stars, each one of whom is trying for an individual record, and another team of mediocre players who work together, somehow or other the mediocre team have the biggest percentage of winnings. The manager of the latter team has usually instilled into the minds of its players that the team's welfare is paramount, and that individual records do not count.

It is surprising how much help one department head or overseer can give another if they are harmonious. To insure that they will work together some companies have evolved the following plan: On the first Friday in every month they have a meeting of the heads of all departments. Experience has shown that the best time for such meetings is in the evening, and where a club house or even a hotel is available, it is well to have the superintendent or some officer of the company as host and all sit down to the evening meal together. This creates fellowship and allows plenty of time to concentrate on the matters in hand. These meetings, which will only cost the firm the price of the dinners, are worth ten times that amount in the good they do. If any foreman has some good idea that he has found applicable, he tells of it so that the others can also take advantage of it. Or if one of them thinks of some idea he mentions it so that a discussion of it will bring out its advantages or its disadvantages.

It is believed by some that business and sociability should never be mixed, but in a number of instances it has worked well. It is strictly a business matter but should be conducted as informally as possible, and by meeting thus at dinner, time in getting together is saved and all are better able to meet at a convenient and stated hour. Eating together also tends to a more intimate acquaintanceship. The foremen get to know each other better, to know the superintendent better and the firm get the benefit through the harmony it engenders.

This harmony and shop loyalty may also be cultivated among the operatives by the application of some of the so-called welfare work plans. A bowling alley with prizes offered for the rival clubs in the winter. A baseball trophy for summer. A moving picture show, which the small admittance charge will easily keep supplied with new pictures. A rule establishing free admittance for children under a certain age. A thousand and one different things that may be done all tending to harmony, to shop loyalty, to cooperation and to success.

The problem of finding a satisfactory market for the Arizona long-staple cotton of the Egyptian type has apparently been solved. The crop of 1913 in the Salt River Valley amounted to 2,100 bales and was grown from seed bred by the Department of Agriculture.

Some difficulty in disposing of this cotton was anticipated, for the reason that it is a new product, with which manufacturers were not familiar. Nevertheless, information has recently been received that the 1,200 bales produced by the Cotton Growers' Association of Mesa, Ariz., have been shipped out, a part on direct sale and a part consigned to eastern brokers on a liberal advance.

In order to open a wider market for this cotton, 50 bales were consigned in December to a broker in Liverpool. A few days after this cotton was landed 26 of these bales were sold at a price of 23½ cents, which netted the growers, f. o. b. at their shipping point in the Salt River Valley, 21½ cents per pound. In the present condition of the long-staple market this price indicates that English spinners consider this cotton equal to the best grades produced in Egypt. Several hundred bales have already been sold to American spinners at a price which makes this a very profitable crop for the irrigated lands of the southwest.

As a result of the progress made in marketing the 1913 crop, the farmers of the Salt River Valley are now unanimous in their determination to plant only the one variety and to keep out upland cotton, the presence of which would cause a speedy deterioration of the long-staple variety now being grown through hybridization and consequent deterioration of the stock.

Don't be afraid to work; it is healthy physical and mental exercise.

LEGISLATION AND BUSINESS

The Conclusion of the Address Before the Cotton Manufacturers' Association of Georgia at its Annual Convention.

BY HON. JAMES A. EMERY, COUNSEL FOR THE NATIONAL ASSOCIATION OF MANUFACTURERS.

(*Continued from last month.*)

Another form of social legislation of wide application and great interest is that relating to social insurance, which includes workmen's compensation, sickness, old age and unemployment insurance. A few years ago we referred to all such proposals as "Socialistic," but the increasing complexity and changing form of our industrial structure, within which vast groups of men are working rapidly amid quickly moving, intricate machinery, operated by and transmitting highly dangerous forces, makes us realize its intrinsic dangers, which its directors must not only prevent by every precaution but for the direct consequence of which in work injuries, those who set these forces into motion and provide for their use must become responsible, and they, together with society, whose agents in production they are, must undertake to meet the economic consequence of inevitable work accidents.

The relationship of the common law were well enough for the conditions to which it applied, but the conditions of employment change much more rapidly than the principles of liability. The percentage of injuries for which neither employer nor employee can be termed at fault, in the sense that they are due to the negligence of either, constantly increase in number, and for these, no one being liable, there is no provision for the worker or his dependent family in case of his disability, except he become a public charge.

On the other hand, an attempt to make the employer personally liable by imputing negligence through extreme employers' liability statutes for conditions entirely beyond his control places an undue and unjust burden upon him. Workmen's compensation undertakes to make partial provision for every injured worker during the period of his disability, without unduly burdening the industry. Under the existing system, a few injured workers receive large sums, the great majority little or nothing. The employers are unjustly mulcted in individual cases, and there is necessarily less inclination or ability to make any substantial provision in the great number of cases in which there is no legal liability.

Naturally novel legislation, often fashioned under political pressure and without adequate information or study upon the part of the legislator, will result in injustice. These conditions will be largely averted where the employer, realizing the substantial necessity for the substitution of compensation for liability, takes his proper place as a progressive leader of rational reform, and undertakes, in cooperation with the legislator, to assist in the formation and enactment of a statute to give substantial relief to the injured worker without unduly burdening the industry.

In this connection, it is worth noting that not every industry can translate a new charge into the cost of its product with equal facility. To carry a new charge to the consumer in the price of the product is easiest for a monopoly and becomes increasingly difficult as you go down the scale to the sharpest forms of competition. Moreover, in the sale of every article, the manufacturer reaches a point in which the increase in cost tends to discourage the consumption of the article. These intensely practical questions must receive the careful consideration of the legislator, or, instead of conferring benefit, his proposals carry damage, and possibly destruction. It too frequently happens that those quickest to urge reforms are the least familiar with the subject of their activity. It is perhaps fortunate that in matters of legislation the sincere radical is not always intelligent, and the intelligent radical not always sincere. The one is anxious to immediately enact but experiences difficulty in formulating his enactment. The other is more anxious to exercise than to execute, and the collision between the two, one of whom wants to talk reform and the other to accomplish it, frequently results in that saving condition which is said to follow when an irresistible movement meets an immovable obstacle.

At this point, even at the risk of repetition, I again urge upon you the importance of studying the various proposals such as those to which I have alluded, which undertake to use the power of Congress to regulate interstate commerce for the purpose of obtaining control of conditions of production by declaring that commodities which are not produced under certain conditions as to hours, wages and other terms of labor, shall not be introduced into interstate commerce. As 90 per cent of all our manufactured products are consumed outside the states of their production, such proposals, if valid and enforcible, would fix the conditions of production and deprive the maker of the commodity of his market.

Surely it is certain that the interstate commerce power was never intended to make Congress a local governor for each state or a town council for every community. We know the power of regulating intercourse between the states was conferred upon the Federal government because during that critical period between the Revolution and the adoption of the Constitution, local jealousies and trade rivalries had caused the various Colonies to put such restrictions upon intercourse with other Colonies that some of the nascent states, which had fought shoulder to shoulder during the Revolution, were on the verge of conflict with each other. Indeed, so bitter was the feeling that the Colony of Connecticut at one time forbade commercial intercourse with New York, and it was necessary, to preserve freedom of communication between the states and liberty of trade for all citizens, that some central authority should have the power to enforce the right of every citizen to trade freely with every state and to make uniform and ex-

clusive rules for such intercourse that no state might set up rules of its own.

Under the proposals now pending in the House and Senate, and introduced by Mr. Palmer, of Pennsylvania, and Senator Owen, of Oklahoma, commodities produced in whole or part under conditions other than those fixed in the bill would be excluded from commerce between the states unless produced as the bill dictated, and thus Congress would become the master, not of intercourse but of production, and a Federal body at Washington could exercise the police power with respect to the domestic matter of production, and every state would be deprived of local self-government to that extent.

Such an attempt would confer a power never intended upon the central government, and becomes the more serious when we consider the forces which are undertaking systematically to inflict their economic views upon the nation through a highly organized minority movement, exerting a powerful political influence at Washington.

We find in the American Federation of Labor some two millions of members, with 115 international organizations, 40 state federations and 30,000 local unions, either undertaking, in state and national legislation, to secure the enactment of their economic theories into law, regulating hours, wages and working conditions, or endeavoring by legislation to deprive the unorganized worker and the employer of the legal remedies which protect him from the coercive and intimidatory tactics and methods of this powerful organization. With the right of men to organize for the betterment of hours, wages and working conditions by lawful means, no intelligent man can quarrel. The very right to do this presumes an equal right on the part of non-members of the combination to pursue their own way and work out their own economic salvation as their judgment recommends. Our last census shows 35,000,000 wage earners in this country. We find this body, to accept its own figures of 2,000,000 of men, endeavoring to secure the exclusive employment of its own members, and where that is refused, undertaking to destroy the patronage of the employer who refuses to subject himself to these conditions, and prevent the employee, who refuses to become a party to the combination, from obtaining employment until he does.

Not only have individuals suffered from these conditions, but whole communities have been damaged, isolated and desolated by the interruption of communication and intercourse with other communities in the effort of this combination to impose its will on its own or other employers.

In this day of specialization, our municipalities, which have become the great centers of industry, depend for the raw materials sustaining continued production and for food stuffs and fuel, upon agricultural and other industrial communities, and the uninterrupted maintenance of communication is essential, not merely to the prosperity of such communities, but to satisfy their daily wants. Again and again we have seen such communities isolated by railroad strikes, or common carriers accepting terms they could ill afford, because the consequences of their refusal meant not a mere withdrawal of the service of their employees but a determined and disorderly effort to prevent the employment of others, and, unfortunately for our country, the very frequent failure on the part of the administrative officials to enforce law and order and protect endangered personal and property rights.

Such combinations have inspired not only industrial but political terrorism and will continue to do so until the average citizen, and particularly the business man, meets organization by counter-organization and arouses every community to the disastrous results which must follow from the continual surrender of the most fundamental rights to the demands of a highly organized and systematically acting minority, chloroforming executive officials and terrifying legislators not only into the granting of special privileges for such combinations but their exemption from civil or criminal liability.

This combination which I describe is not merely undertaking to interrupt production in communities by strikes which endeavor to prevent production except under the terms demanded by the combination, but it has aimed the boycott at every form of distribution. No man questions the right of a body of men to quit for the purpose of withdrawing their labor power in order that such loss or inconvenience, if it cannot be replaced, should cause an employer to accept the terms demanded by the combination. But this combination goes much further and is brought under the ban of the Sherman Act by the effort to prevent the sale of manufactured products in other states, or their distribution or re-sale, or the making of contracts for all of these purposes unless the manufacturer agrees to produce under the terms demanded by the combination. This is accomplished through the boycott, by which the combination, through agencies in many states and the cooperation of many local unions, threatens the manufacturer's customer with the withdrawal of patronage if he continues to deal with the manufacturer, and, in turn, threatens his customers with like attack if they, in turn, do not withdraw their custom or breach their existing contracts.

A combination for this purpose has been both unlawful and criminal from the earliest days of the common law. Federal and State courts have alike condemned it, and it is the effort to destroy the effects of these decisions by new legislation which has caused so much controversy in the attempt to exempt unions from the Sherman Act or to alter the law with respect to injunctions. Thus, to either deprive the citizen of the only efficient remedy by which an equity court can protect the rights of employer and non-union workman against the intimidating and destructive tactics of the union combination, or else, by complete exemption from the general principles of law aimed at all combinations to secure relief from either civil or criminal liability and permit such organizations during a labor dispute to run wild, while every other combination under like circumstances could be enjoined, sued in damages or punished by fine or imprisonment for the same acts.

A measure having this purpose is the so-called Bartlett bill introduced by a distinguished Congressman from your state, which undertook to say that any combination of workmen for the purpose of improving their hours, wages or working conditions should be lawful, apparently without respect to the means which they employ to accomplish such a purpose. And, second, that no Federal court should issue an injunction in a labor dispute except to protect property or property rights from irreparable injury. It is then provided that for the purpose of the act, the right to employ or be employed, or the good will of business, or the right to do business of any particular kind or at all, shall not be considered a property right. In every other controversy the same rights remained as they always have

been—the most fundamental of property rights—but in a labor controversy they are to cease to be, and thus be deprived of the protection of an injunction.

The Sherman Act has always measured labor combinations by the same principle which applied to every other combination under like circumstances. It has always recognized their right to exist and to undertake to improve the hours, wages and working conditions of their members by every lawful act. It is only when they have undertaken to interfere with the freedom of trade or of the trader or worker that they have been enjoined or mulcted in damages. While the government has brought numerous suits against business corporations and combinations and undertaken to dissolve them or imprison their officers, or confiscated their possessions, it is only in one or two rare instances that the government has undertaken to enforce the Sherman Act against labor organizations, and then only by the isolated act of local district attorneys, who have been promptly called off by the Department of Justice, so that, practically speaking, so far as the government is concerned, these labor combinations have enjoyed exemption from the enforcement of the law, although there exist numerous instances of its plain violation by them. The constitution of the American Federation of Labor itself declares that one of the chief purposes of its existence is the prosecution of boycotts, a statement which its officers made in the Supreme Court of the United States, and which made it by that admission an illegal combination.

The Loewe case, the Buck's Stove & Range case, were each instances in which the gigantic machinery of the American Federation of Labor was set in motion for the purpose of ruining the business of two manufacturers who had refused to subject the operation of their factories to the will of this combination. Every effort was made to compel customers in every part of the country, through threats carried by personal emissaries, through committees of local and state labor organizations, not only to cease dealing with these manufacturers but to break any existing contracts with them. Yet in each instance the private citizen was compelled to pursue his own remedy without assistance from the government. In the famous McNamara case the record of the trial shows that the Structural Iron Workers' International Union not only undertook to prevent the members of the National Erectors' Association from obtaining contracts for erection by threatening their customers in many states, but they undertook to prevent the execution of the contracts by intimidating and assaulting the workmen in many cities, either by threatening to and actually blowing up the structures in course of erection or by destroying the structural material in transit on interstate railroads. Yet, in spite of this frightful record of crime and destruction and assault upon life, the government, possessed of this awful record, has never made a movement to dissolve this criminal organization, which, under the direction of its chief officers, wandered through the domain of interstate commerce for five years carrying death and destruction in its most awful form.

Now it is proposed by the legislation pending in the House, known as the Clayton Bill, that combinations doing the things I have here described shall neither be held nor construed to be combinations in restraint of trade, because they have not capital stock and are not conducted for profit. The capacity of a combination to prevent the operation of a railroad, to destroy structures in course of erection, to sandbag customers into abandoning relations with the manufacturer, is demonstrated in the Debs case, in the Me- upon the possession of capital stock by the parties to the Namara case, and in the Loewe case, depends in no way conspiracy. It might as well be said that the Mafia were incapable of restraining trade between New York and New Jersey if it compelled Italians who did not pay it blackmail to abandon their trade relations between those states because the organization possessed no capital stock.

Recently, in the city of New York, a great printing exposition was to be opened at the Grand Central Palace. Those in charge of the exposition applied to and made contracts with various manufacturers of printing supplies for the sale of exhibition space and the installation of exhibits. A manufacturer of presses at Battle Creek bought space and delivered his machinery in New York for installation. It seems that several years ago this manufacturer had refused to make an exclusive agreement with the International Machinists' Union for the sole employment of their members. So when the press of this company was presented at the exposition for installation, the Machinists' Union refused to install it, and at their instance, the other labor organizations notified the exposition authorities that its installation by any other mechanics would be the signal for a strike in the exposition, which meant that it could not open on time and the exhibit of this printing company must be excluded from the exposition, or the exposition was damned, a failure. Hundreds of thousands of dollars were at risk in the success of the exposition, and under these conditions the Federal court in New York issued an injunction preventing the calling of a general strike for the purpose of preventing the installation of this machine and the ruin of the exposition. This is a striking example of an unlawful strike in which men combined to use their labor power for the purpose of working a malicious injury to another.

No intelligent man can believe that since men cannot use their hands or tongues or property for the purpose of doing an unlawful injury to another, they should be able to withdraw the service of any of these for the purpose of accomplishing any of these things. It cannot be lawful for a body of men to strike to compel the employment of a criminal or a drunkard, or of an incompetent person, and we need nothing more, than a clear distinction between lawful and unlawful strikes, for this goes to the very root of the vicious proposal embodied in the Anti-Trust Bill now pending in the House, that certain acts which are there enumerated and which by a strange coincidence usually accompany a labor dispute may never be enjoined.

No act is so good in itself that it may not be a link in a conspiracy or a step in an unlawful purpose, for it is the motive or purpose of the actor which makes the smallest and most commonplace acts of everyday life good or bad, lawful or unlawful, right or wrong. Our labor friends say men have been enjoined from walking on the public streets, from using the public roads, from persuading men to quit work. Daniel Webster caused a man to be hanged, in the famous White murder case, because he was walking up and down a public street for the purpose of warning a fellow thief of the approach of the police, and the fellow thief killed an old man after committing a robbery. No man has ever been privileged to use a public street except on equal terms with every other person, and the moment he under-

takes to deny him access to the street, he unlawfully uses it. It has always been unlawful for one man to pursuade another to break his contract with a third, and these principles have always applied to every kind of a controversy since common law grew out of common sense, and no objection is made to the application of these principles save in labor disputes. So, gentlemen, you observe that the principles at issue in this legislation are fundamental in their nature. They reach into the very roots of human right, they affect the most important of everyday relationships, they can be violated only with grave danger, they can be set aside in favór of one class only by utterly destroying the most American of all concepts—equality before the law.

In the very Clayton Bill to which I refer it is to be made unlawful for a business man to discriminate in practice between consumers in various parts of the country. Hitherto we have thought every individual had the right to fix the price of his own goods unless he cut prices for the purpose of creating a monopoly or establishing a restraint of trade. Now the mere act of price discrimination by an individual, irrespective of its effect, is to be made criminal. Hitherto that was true only when done by a combination. The very moment when the law is thus made more drastic in regard to the business man, it is proposed that in a labor dispute no act of a labor combination shall be unlawful unless the act would be unlawful if done by one person. Thus you perceive that, for business men, what was hitherto unlawful for a combination is to be made unlawful for an individual, while for working men only what is unlawful for an individual is to be unlawful for a combination. It is politics and not logic that lie at the root of such discrimination, and they are equally manifested in the legislation of some twenty states, which make it lawful for a striking workman "to picket" in order to communicate to any other workman information respecting a strike or other conditions in the plant of which he is a prospective employee. On the other hand, in the same states, it is made unlawful for an employer to communicate to another employer any information which tends to or is intended to prevent a workman from receiving employment or to give information with respect to his participation in a strike. Thus, you perceive, that the same legislators make it lawful and right for one workman to communicate information to another workman respecting his employer's record, while it is unlawful and wrong for the employer to communicate information to another employer respecting the employee's record.

In the recent so-called lobby investigation, it was considered reprehensible for organized employers to take an interest in the election of Congressmen who voted for legislation which such employers believed to imperil the fundamental principles of the government, or to oppose the very principles which organized labor is now undertaking to have enacted. And while there was no instance shown in which organized employers had ever contributed through any organization one dollar to the campaign fund of any Congressman or a Congressional committee, it was considered highly reprehensible that many business men had individually contributed to the campaign fund of Mr. Littlefield, when the whole power of the American Federation was turned against him in an endeavor to defeat him because he had refused to support its demand for exemption from the general principles of the law. The evidence taken disclosed that organized labor had pledged itself to defeat members of Congress who opposed its demands and to elect men from their own ranks to represent their interests and constantly to be practically their attorneys on the floor.

The Federation of Labor spent $8,000 in one year and $8,500 in another year to defeat members of Congress. They boasted of making candidates crawl to their headquarters with explanations and apologies for their adverse votes. They boasted the possession of 16 labor members of the House, a Senator and a Cabinet officer. They told of recommendations for the chairmanship of the Committee on Labor, which, by a curious coincidence, was always accepted by the appointing powers. They pointed with pride to the fact that the majority of the majority members of the House Committee on Labor were all union officials. Their legislative committee reported week after week and month after month their endeavors to pledge individual members of Congress to the support of their program, under threat of political opposition, but this was considered merely evidence of legitimate and proper activities. While the organized effort of business men to procure and distribute information respecting pending legislation, to arouse manufacturers to the importance of opposing class legislation and supporting members of Congress who were made the subject of attack by organized labor was considered suspicious and reprehensible.

Such a double standard of judgment could be produced only by the systematic, determined activity of organized labor and the indifference and inactivity of business men. Human nature is not greatly changed since the great Virgil described the Roman Senator "who saw and approved the better course but followed the worse." If public men are to receive continuous pressure, representations and threats from organized labor and to hear but infrequently from business men, if the one is insistent, determined and organized, the other careless, silent and indifferent, there can be but one result: One will be heard and heeded—the other unnoticed or assailed.

Elbert Hubbard related not long since that he visited a famous asylum in one of the eastern states and expressed to the accompanying attendant his surprise at the great number of insane persons who wandered at large over the spacious grounds of the asylum. "You are a big man," he said to the guard, "but what's to prevent these people from organizing and seizing you and the institution?" "There is no danger," said the guard, "they don't know how to organize—they are crazy."

The annual report of the chief of customs of the East Africa Protectorate shows that the trade in unbleached cotton textiles, which represents over 50 per cent of the total value of imports of cotton goods received at the port of Mombasa was distributed among the principal countries of origin as follows:

Countries.	1911-12	1912-13
United States	$ 514,284	$ 674,891
India	177,345	332,311
Italy	63,906	211,165
Switzerland	10,716	49,458
United Kingdom	90,619	34,450
All other countries	130,091	6,502
Total	$ 986,961	$1,308,777

SOUTHERN TEXTILE ASSOCIATION

About 220 members and guests of the Southern Textile Association gathered at the Seashore Hotel at the Isle of Palms for the annual mid-summer convention of the association. June 12th and 13th were the days officially set, but the majority came a day early and stayed a day late. As President Wallace expressed it, "they came down to get their annual bath whether they needed it or not."

The first session was called to order at 3:30 Friday afternoon, and as Mayor Grace, of Charleston, who was to have delivered the address of welcome was unavoidably absent, this formality was dispensed with and the annual address was read by President T. B. Wallace, who said in part:

PRESIDENT'S ADDRESS.

It will no doubt be of interest to many of you to know that 100 years ago, or in 1814, the first cotton mill machinery in the South was landed by boat here in Charleston, having been shipped to this state from northern markets, and it was carried by wagons through the valleys of this state to Lincolnton, N. C., where Michael Schenk, who was known as the pioneer manufacturer of the South, installed an equipment of 72 spindles to demonstrate to others whom he wished to interest, the success of this industry. (I can imagine some of you trying to manage a mill of 72 spindles.) It proved a success in every respect, hence Mr. Schenk, together with those whom he was able to interest in the matter, established a "Laboratory" a few years later, which had an installation of 3,000 spindles. Mr. Schenk started operation on his building in the year 1813, completing same and installing his machinery in 1814 and began operation in 1815, therefore the years 1813, 14 and 15 form the triune —three birthdays in southern cotton manufacturing, which has become the greatest industry of the South. Eighteen fourteen is probably the century mark for the landing of the first textile machinery in the South, near where we are now holding our 1914 meeting.

There is a question springing up in legislative halls each year, and it is one that should receive the fair consideration of every mill man who holds a position of authority, which I believe touches every man here that is actively engaged in manufacturing cotton goods, that is, the question of child labor in cotton mills. There is no doubt in my mind that the entire agitation regarding child labor is based on imagination, or from second to fourth hand information, and not on actual observation and contact with the question they are trying to condemn. Some time since, your President was called before the Senate Committee of this state in Columbia, at which certain representatives of the Child Labor Bill got up and in making their plea made statements something like this: "God forbid that a child of mine shall ever have its limbs deformed, its health impaired, and its mental capacity dwarfed by working twelve hours a day for a mere pittance." One also made the statement that the mill owners wanted these children to work because they could get their services for a mere pittance. Gentlemen, this man may have been sincere in his belief and honest in his convictions, but the poor fellow was just mis-informed and never took the trouble to investigate. Every one of you would, I am sure, prefer not to work children, and a lot of you will not unless it is forced upon you by the child's parents, while in most cases where children are worked, you have to employ the child to secure the family, as that family is more or less dependent upon the child for support, or where some widowed mother who has lost all means of support but that of her child, it is either give the child employment or turn them both out to be subjects of charity with no state appropriation for this cause. The mills are all willing and encourage the children to attend school, but there are around every cotton mill quite a few families that do not exercise as good control over their children as they should, and for this reason a good many do not work, neither do they attend school, but loaf around the streets and stores and form bad habits and in most cases are the ones put up as examples when the child labor question comes up. I consider it a question that the people who are to be affected by such a measure

RETIRING PRESIDENT T. B. WALLACE.

should be allowed to decide, and not the people who are in position to allow their children to sleep until 8 A. M. and ride to and from school and who have no conception of real life in our mill vallages.

Another thing which you are all no doubt familiar with, is what has already been done to bring the big machinery show of the Textile Exhibitors' Association of Boston to the South, and we shall probably hear a further report on this subject from our standing committee when the proper time in the program arrives for its report to be read. We all want this exhibit to come South and I believe that an opportunity has arisen whereby every Superintendent belonging to this association can render assistance toward that end. The Superintendents present have, no doubt, received a letter, as I have during the past few days, enclosing a post card and asking for each mill to fill in that post card agreeing to arrange for its superintendent and as many of its overseers as possible to attend this exhibition for at least

one day during its progress. I believe it will be well worth while if you have not already done so, to take this matter up with your mill management and explain to them just how important this Textile Exhibit is to the men behind the guns in the cotton manufacturing business. The assurance of our support, which we will furnish by signing these cards, will go a long way toward inducing the Textile Exhibitors' Association to bring its show to the South. I hope those of you present who have not taken action on this matter already, will do so immediately on your return home.

In my last address I brought up the question of cooperation, and one of the best illustrations of the advantages of this in the business world is that of Andrew Carnegie, who, after attaining the heights of success, compares a business enterprise to a three-legged stool, which is supported by three legs, "Capital," "Business Ability," and "Labor." The leg called "Labor" is to us, one of the greatest problems before the textile manufacturers of the South

PRESIDENT-ELECT E. E. BOWEN.

today. This is a question that we men of this association have to deal with directly, and it devolves largely upon us to handle the problem successfully. The next few years will probably see a great change in the relationship of employer and employee here in the South. In fact, we can note the change taking place now. A greater spirit of cooperation than has heretofore existed between employer and employee must and will come, but as to how this cooperation is to be brought about so as to obtain the best results for all parties concerned remains yet to be seen. Much has been written and said about welfare work, and there is no question but that this branch of work when properly carried on is doing much to bring about a closer relationship between employer and employee. To my mind the Southern Textile Association can be the means of wielding a mighty influence for good along lines of establishing a better understanding between those who are interested in the great industry represented by this Association.

The textile industry, as well as any other, might well be compared to a three-legged stool, which is being supported by the three legs of Capital, Business Ability, and Labor. Our industry would fall flat the moment any one of these was totally eliminated. One is as essential as the other. Without Capital, we could not purchase land and building material for the erection of our mills, or equip them with the costly machinery necessary for manufacture. Without Business Ability, our mills if built and equipped could not operate profitably. Without Labor, our Capital and Business Ability would remain unemployed, here we have the combination, the cooperation of Capital, Business Ability and Labor, each dependent upon the other, and like the stool, the textile industry cannot stand without each of the three legs working and holding up its part of the load. Capital unemployed soon diminishes and is of little service to man, likewise, Business Ability serves no useful purpose except where intelligently employed. Labor cannot secure employment unless business enterprises are developed requiring their services. Thus you see why there should be a spirit of cooperation between these classes of people, and it is just as impossible for Labor to get along without Capital as it is for Capital to get along without Labor, and the earlier all parties see things in this light, the earlier there will be harmonious relations existing between all classes of people, and it is our duty to do what we can to bring about this understanding.

I also wish to express to the association my personal views touching the By-Laws. I think they should be changed so as to increase the dues of superintendents and traveling men to such an extent as to create a fund sufficient to pay our secretary a reasonable salary for his services, this amount of increase as well as salary to be decided upon by proper committees. My personal observation since being president of this association has shown the duties that devolve upon the secretary are far more than I ever dreamed of, and to conduct this office as it should be requires considerable time from other duties, and I do not think it anything but just to give the secretary a reasonable compensation for his services. And furthermore, as my personal opinion, I am in favor of extending to traveling men all privileges of the association except that of holding office, and think the By-Laws should be so changed. I also recommend that the incoming president be given full power to appoint the program and arrangement committees to act during his administration.

In conclusion: One year ago this association conferred upon me the highest honor in its power to bestow. I was made President, which carries with it certain duties and responsibilities, all of which I have performed to the very best of my ability. I entered upon my term of office with a full determination to do my best for the upbuilding of the association. I not only encouraged new membership, but through official letters, and personal contact whenever possible, encouraged old members who had grown more or less cold, to renew their membership and attend the meetings, and I am glad to say that I do not consider my efforts in vain. I feel that our association is growing each year and will continue to grow under the direction and guidance of able men who from time to time will be placed in the position I will soon vacate. *This association is here to stay.* I desire especially to thank Secretary A. B. Carter for the kindness and courtesies shown me during the past year and for the hearty cooperation he has shown in all things promoting the good of the association. To our committee of arrangements I also wish to express my appreciation con-

eaning the way our conventions have been held and the spirit of cooperation with which they have worked in order to make the convention a success, and to every member who has tried in any way to improve the association I want to extend my thanks, and now as I will at the close of this convention turn over to my successor this high office and retire to the ranks, I beg to assure you of my gratitude for the high honor conferred upon me one year ago. The fact that you deemed me worthy of the high office of president is a mark of your confidence and esteem which will be a source of pleasure as long as life lasts.

Then followed in their order on the program several interesting papers as follows:

"Aims and Purposes of the Southern Textile Association," by J. M. Davis, superintendent Newberry Cotton Mills, Newberry, S. C.

"Cotton Combing," by P. A. Gwaltney, superintendent Holt-Williamson Mfg. Co., Fayetteville, N. C.

"Manufacturing Goods for the African Trade," by R. M. Odell, commercial agent, department of commerce, Washington, D. C.

"Management of a Fancy Weave Room," by L. O. Bunton, overseer of weaving, Wylie Mill, Chester, S. C.

Cotton Manufacturing Methods in Japan," by W. A. Graham Clark, commercial agent, department of commerce, Washington, D. C.

A number of these papers appear elsewhere in this issue. As a whole these papers were exceptionally fine and each speaker in turn found an audience thoroughly interested and attentive. After this session the balance of the day and night were devoted to social pleasures.

The second session was set for 9:30 Saturday morning, but long before that time many interested mill men were present taking another look at the very interesting collection of cloth samples exhibited by Commercial Agent Odell, who was also on hand with explanations, many times quite as interesting as the samples.

The first item on the program for this session was the adoption of a number of resolutions, the most important of which was as follows:

Whereas, the members of the Southern Textile Association have heard with deep interest the addresses of Commercial Agents, Ralph M. Odell, and W. A. Graham Clark, and have examined the large collection of samples of cotton goods on exhibition, and, whereas, this convention appreciates the great value of the work which the Department of Commerce is doing to assist American cotton manufacturers in extending their export trade by supplying valuable information and interesting samples for study, now therefore be it

Resolved: First, that this convention composed of men who are actually engaged in cotton manufacturing in the South, heartily endorse the work of Messrs. Odell and Clark and urge that the work be continued.

Second: That the thanks of this association be extended to Hon. William C. Redfield, Secretary of Commerce, for permitting Messrs. Odell and Clark to attend and address this convention and for the practical demonstration of the requirements of the foreign markets that has been afforded through the exhibition of samples.

Third: That a copy of these resolutions be spread upon the minutes of this association and a copy forwarded to the Secretary of Commerce.

Birmingham was chosen as the place to hold the November meeting. W. M. Sherard then read his report as chairman of the committee on the textile machinery exhibit. He was followed by J. M. Davis, who had seen the exhibit in Boston and was enthusiastic over the efforts being made to bring it South. Mr. Davis concluded by requesting L. L. Arnold, the editor of COTTON, to exhibit a several foot list of mills who had pledged themselves to send some of their men to this exhibit if held in Atlanta in 1915.

Mr. Arnold explained that he had secured this list in nine days, including the time taken by the postal service to deliver his letter to the mill and return the post card enclosed from the mill to him. He explained further that of the 250 mills on this list, 53 had promised to have their superintendent and all overseers present. Of the balance of the names on this list there was anywhere from the superintendent and six overseers down to the superintendent only.

Secretary Carter also spoke on this question. He was followed by W. C. Dowd, who offered a resolution urging

VICE-PRESIDENT W. M. SHERARD.

the Textile Exhibitors' Association to hold an exhibit in the South.

Then came the various committee reports, which were followed by the election of officers. The officers for the ensuing year are as follows:

President, E. E. Bowen, Greer, S. C.
Vice-President, W. M. Sherard, Williamston, S. C.
Secretary, A. B. Carter, Athens, Ga.
Treasurer, Marshall Dilling, Gastonia, N. C.

BOARD OF GOVERNORS.

Chairman, Frank E. Heymer, Alexander City, Ala.
John L. Davidson, Griffin, Ga.
Alonzo Iler, Greenville, S. C.
Robert F. Bowe, Greenville, S. C.
John W. Clark, Durham, N. C.
T. H. Webb, Duke, N. C.
A. A. Cottingham, Union, S. C.
James A. Bangle, Greensboro, N. C.
M. B. Clisby, Newberry, S. C.

C. P. Thompson, Trion, Ga.
J. W. Kelly, Pelzer, S. C.
D. R. Harriman, Jr., Greer, S. C.

The entertainment features of the convention were fully up to their usual standard and Chairman Iler, of the Arrangement Committee, is to be congratulated on the successful manner in which he handled these features.

AIMS AND OBJECTS OF THE SOUTHERN TEXTILE ASSOCIATION.

BY J. M. DAVIS.

The subject assigned to me is one I am in deep sympathy with, and I shall discuss it under four distinct principles. These four principles are: first, promotion of good fellowship; second, increase of efficiency; third, unflinching loyalty and integrity in business relations; and, fourth, an enlarged conception of our duty to employees.

Unless good fellowship permeates this entire organization it will never come into the full realization of its highest usefulness. Here, there can be no littleness, no selfishness.

J. M. DAVIS.

A contagious enthusiasm for the other's good must be manifest in the heart and in the act. The keystone of life's arch is helpfulness. This is a secret easy for a noble heart to learn and when possessed makes the life fuller and richer; for it is written in God's divine law that he who would be greatest must render the most service to the race. It is easy given and costs the giver nothing, and yet the hearty handshake of a fellow craftsman will carry encouragement and lighten the load and put renewed vigor into the heart and mind of those less fortunate.

The conditions of our modern commercial life have become such that man no longer stands alone. Each man has his influence in the environment in which his destiny has placed him. Likewise, each one must depend more or less upon the other. It is therefore well for our organization to look well to the promotion of good fellowship, and we shall accomplish larger results in proportion to the growth of this principal. Holding firmly to this principle we shall not only reap a larger business success; but there will be a growth and enlargement of the ideals of the individual. Thus, if our organization stood for nothing else than for the hearty handshake and good will of a fellow craftsman its existence would be amply justified.

But vitally connected with this mutual good will and fellowship comes the second great principle, which is efficiency, and this is in a large measure an outgrowth of the former. This world today is teeming with new dreams and new schemes. Millions of capital are invested in our industry in the South; and hundreds of ambitious men in the ranks are struggling for success just like you and I. But every round of the ladder by which they climb to success, if they reach it at all, has written on it in burning letters that deep meaning word, *efficiency*.

In the olden days, when the life of the individual was comparatively simple and not beset with the intricate exactions of modern commercialism, a man could do far better and succeed with less ability. But today we are hemmed in on all sides by sharp competition, and competition with efficiency worked into its very warp and woof. Efficiency, therefore, we should welcome and cultivate; for it is after all our only guarantee of a permanent place in our line of business. The business world is so delicately adjusted that each day is twenty-four hours ahead of the previous day. This means, so far as we are concerned, that there must be no Rip Van Winkles among us. A progressive man must be a man wide-awake and on the alert. A writer during the French Revolution said an army of men could be defeated, but that an army of ideas could never be conquored. Today there is a magnificent and splendid forward march of new ideas, and particularly in our line of activity. New chances and brilliant opportunities are all around us. The very atmosphere is laden with them. We should embrace these opportunities. To do so one must be willing to pay the price of vigilance. The motto should be: study, read, listen, and work, and work. It is an unchangeable law that without service no man can hope to rise into a position of large responsibility and long remain there. But with efficiency suited to our vocation, one may climb higher and higher with the assurance that the higher one climbs the less will be the competition.

Economy is so closely related to efficiency that it deserves special notice. Every manufacturer realizes that he must study to save. He must be a master here if anywhere. He must have thorough knowledge of everything that tends toward economical methods. The business world today is demanding that wastes be turned into profitable results. Efficiency produces economy and extravagance is a commercial crime, and he who is responsible for this commercial crime is a business outlaw.

Let us look at this proposition from another standpoint. There are always two classes of men at work. The construction gang and the wrecking crew. It is useless to ask to which of these two classes the successful man belongs. We know that only those who are found on the side of efficient and constructive development succeed. Today we must use the efficiency of yesterday to reap the reward of tomorrow.

There is another point growing out of this discussion. It makes little difference whether we name it elimination or selection, it means the same thing. Men best suited to

produce required results must be selected. Certainly for the most responsible positions men with large mental equipment and executive force will be chosen. My plea, then, is that this organization should serve to increase our worth to our industry, intensify our enthusiasm and earnestness of purpose. If it does this, and it is doing it, it will grow more and more useful to all of us as the years come and go.

But of course, it has already occurred to each of you that it makes no difference how genuine may be our fellowship or how splendid may be our efficiency, this organization could never reach its best usefulness, or we do our full measure of good, if we did not have our aims and asperations anchored in absolute loyalty to each other, to this organization, and to the textile industry of the South. Loyalty, as I use the word, is intended to embrace what might be termed honesty of purpose and sincere cooperation. There may be spasmodic instances of success here and there, but if this great industry is to move forward as a factor in the development of the South and is to do its part in making this section of our great country a leader in manufacturing, as she is destined to be a leader in other things, we have got to all pull together, and do what President Wilson calls "team work." That is only another name for loyal cooperation. We cannot place too much importance upon this principle. Not that we are more liable than others to ignore it, but because we are bent on ultimate success, and it cannot otherwise be attained. We shall succeed precisely as we hold to this great idea that is as old as the day when God's stars first sang together in harmonious symphonies. Cooperation was the ruling principle in creation, and still runs through all lines of activity.

In our line of work, as well as in any other, we want big men. Men with big hearts and big souls. Men who are ever ready to see good in others and to help develop those who have promise. A small, jealous man in one department, scheming against another man in a different department, to the detriment of the industry employing him, must be either cured of his malady or boycotted by us. We must give such men to understand that we consider such a person low and contemptible. Each department should cooperate as well as each individual, and if this cooperation is backed by efficiency, success is a certainty. One of the results of dishonesty and a lack of intelligent cooperation is not only that those responsible fail in their wicked schemes, as they should, but also the innocent are very frequently injured.

Then, too, there is a wholesomeness and enthusiastic vigor about those who are engaged in honest and sympathetic endeavor. To thus work is to enjoy life, to live longer, and to reap the full joy of knowing that you are doing things worth while. Such men will always find their services in demand, and the business entrusted to their care will handsomely succeed; but on the other hand it takes no prophet to foretell the failure of any concern that has its business managed by men little in heart and thought. The world loves a big man; and it measures his bigness, not by the size of his body but by the size and texture of his heart and head. Efficiency that lacks honesty and loyalty is dangerous to any concern, while honesty and loyalty, lacking efficiency may render *some* valuable service. Of the two, the latter is always preferable.

I shall now deal with the last of the four principles I set out to discuss, namely, an enlarged conception of our duty to employees, as briefly as possible. Not that it is less important than the others; for it is of all the things that come under our work, at once the most sacred and most important, and for that very reason it does not need extended argument. It is something that we are all beginning to realize more fully than ever before, and it is a proposition that we are all agreed upon.

We occupy a position of influence in our respective spheres of labor that few other men enjoy. It is not stating the fact too strongly to say that we have within our power the shaping and moulding of the destinies of thousands of young men and women. My plea is that we shall be circumspect in all our actions and that we shall use this position of influence for lifting to a higher plane of usefulness and happiness those whose keeping is so largely placed in our care and for whom we are particularly responsible. The life of these thousands of men and women and boys and girls is a peculiar one. But let me say right here that it has not the serious disadvantages that many ignorant critics impute to it, and it has vast advantages over any other community life of modern times.

There was a time when life in a mill village seemed to be sufficiently described when the term "factory hill" was used. I am proud to have lived long enough to have seen the term lose about all of its odium. Formerly life on these hills was quite unsanitary, and the morals were sometimes what they should not have been. Though I have never thought they were worse than in what we understand is the morals of "high society." But today the wide-awake men in this industry we represent, are enthused on development. Mill villages are laid out with some idea of beauty. The houses are built with comfort and neatness in mind, and schools and churches are established and maintained. Nor does our interest stop with these things. We are today adding libraries, swimming pools and bathing houses, musical organizations, and fraternal societies, so that now a mill man or woman may, if any effort is put forth in their own interest, become a well educated and developed individual.

In this great work those of us who have come out from among the masses can be of the greatest usefulness in bringing about this vast improvement over former conditions, for we can appreciate their needs and desires as possibly no one else can. Above all, let us convince them that we are doing for them because we want to and because our hearts are in the work, and then they will both appreciate it and profit most by it. We should not act in this work as if we are better and are merely giving alms. This spirit will be rebuked by them and I don't blame them for it. You would do the same thing, and so would I. Our people are a proud people, and we should cultivate this pride and not wound it. With our knowledge and experience of local conditions, and understanding our people as no others can understand them, it is for us to direct the energies of those who wish to help in this work and see that no mistakes are made.

In conclusion allow me to repeat that, it seems to me, these are the four great cardinal principles our organization stands for and that it will be useful to its members in proportion to the closeness with which they adhere to and are guided by them.

Don't be afraid to help the boss. He who helps the boss helps himself.

MANUFACTURING GOODS FOR AFRICA.

BY RALPH M. ODELL, COMMERCIAL AGENT.

Africa, which has a population of 170,000,000, or more than that of North and South America combined, is one of the most important markets for cotton goods in the world. Owing to the warm climate, cotton is the chief material for clothing, and as there is practically no manufacturing industry in the whole continent, all the goods which are used must be shipped from abroad. The natives are gradually being civilized and adopting clothing so rapidly that the consumption of cotton goods has increased enormously in the past few years. The kinds of goods which are being used in many sections of Africa today are grey sheetings and drills and a large part of them come from mills in North and South Carolina, Georgia and Alabama. The sheetings are 36 inches wide, 3.00 to 6.00 yards per pound, 30 yards per piece, and 25 pieces per bale; and the drills are 30 inches wide, 2.85 to 3.50 yards per pound, 40 yards per piece, and are packed 20 pieces to the bale.

RALPH M. ODELL.

The natives sometimes wrap the goods around their bodies loosely, but often they make the cloth into a long loose gown which usually bleaches owing to the action of the hot tropical sun and constant washing. I spent most of last year in Africa traveling from country to country for the purpose of finding out the exact kinds of goods which the people require and suggesting ways and means by which the American cotton manufacturers can increase their export trade. In Abyssinia and East Africa I found that we supply more than half of all the grey goods used in the country, our shipments to these markets in 1913 amounting to nearly 50,000,000 yards, valued at over $2,000,000. This is a matter which should be of particular interest to you, because most of these goods were made in southern mills. In the interior of Africa I often saw in the small shops in the native villages grey sheetings from the King and Graniteville Mills near Augusta, the Pelzer in Pelzer, the Henrietta in Henrietta, the Dwight Mill in Alabama City, and many other familiar brands of grey goods. This entire market is an important one and offers splendid possibilities to our manufacturers because the use of cotton goods among the natives is increasing rapidly.

Our supremacy in the trade in East Africa is being threatened to some extent by Austrian and Italian grey goods which are usually sized more heavily than the American and are often only 35 inches wide with 28 yards of 30 folds or laps to the piece. I also heard some complaint about the condition in which our goods reach Africa and I saw a number of bales of cloth from this country on which the binding ropes were broken and the burlap badly torn, thus exposing the goods to damage. The goods shipped to these far away markets are subjected to considerable handling and they must be substantially packed in order to reach their destination safely. European bales are usually covered with heavier burlap than ours and have a water-proof paper lining with broad iron bands for binding.

Unfortunately American manufacturers are furnishing only grey goods to the African markets and we have no share in the trade in bleached, colored, and printed fabrics. The native African, like the American negro, usually prefers gay colored garments, but he has been too poor in the past to buy them. As the country develops and the buying power of the people increases, the demand for colored goods grows and the use of grey goods tends to decline. In South Africa where $10,000,000 worth of piece goods are imported every year, American cotton cloth is practically unknown. Very few grey sheetings are imported and the chief demand is for prints, ginghams, colored flannels, and bleached goods. These are lines which we manufacture here, but because our goods are not of the proper width and have not the design or finish which the people want, we have not been able to secure much of the trade.

The average manufacturer or superintendent, as I know from my own experience, usually objects to export orders because they often necessitate changes in width, construction, stamping, packing or finishing. I want to plead with you who are practical men to view this matter from a larger point of view. It cannot be doubted that our cotton mills are producing more goods than this country can consume. Most of you I am sure have passed through periods of depression when it was necessary to curtail production by shutting down your mills or running on short time. You know very well the hardship which this policy entails The only possible remedy for this unfortunate condition, and the demoralization of your operatives which results. the only way in which we can bring about greater prosperity in our cotton industry unquestionably lies in the extension of our export trade. The world today outside of the United States uses approximately one billion dollars worth of cotton goods annually, or more than we manufacture in all of the mills in this country. Of this amount England furnishes over half, while our own share is slightly more than $50,000,000, or 5 per cent.

If we will but set ourselves to the task we can increase this trade considerably, and it is only through your hearty cooperation that this can be successfully accomplished. Do not accept as final the oft repeated claim that we cannot compete with other countries where labor is cheaper. There are many lines of goods, which by means of the high efficiency of our operatives and the use of improved labor-

saving machinery, we can manufacture in competition with the world. The cheapness of foreign cotton goods is often due to the use of lower grades of raw cotton from India or China, which are mixed with American cotton, and to the practice of adding 20 to 30 per cent sizing to the warp. These are two important matters to which the progressive manufacturer of today should give more serious attention.

Mr. Clark and myself have been studying the markets under the direction of the Department of Commerce in order that the manufacturers in this country may ascertain the kinds of goods which the foreign people want. We have brought samples of many of these goods back with us and they are on exhibition here today in order that you may examine them. But we can only supply the information; the task of securing the trade is in the hands of the cotton goods sellers and manufacturers and it is only through their cooperation that any great success can be attained.

I want to urge every one of you present at this meeting to begin to study the possibilities of the export trade, to give all the encouragement that you can to the manufacture of the classes of goods which the foreign countries require, and to endeavor in every possible way to assist the owners of the mills in their efforts to sell their goods abroad. We need a new spirit of determination, from the exporter to the operative, to place American cotton goods in the markets of the world, and if we give more serious attention to this question we can inaugurate a new era of prosperity in the large and important textile industry of the South and put an end to the constantly recurring periods of depression and curtailment which we have experienced in the past.

COTTON MANUFACTURING METHODS IN JAPAN.

BY W. A. GRAHAM CLARK.

Ten years ago the eyes of the world were directed to the northeast section of Asia where in the land of the Manchu two great nations battled fiercely for political supremacy. Today in the same arena there is another contest, keen though peaceable, being waged for supremacy in the cotton goods trade of Manchuria and the textile men of many countries are watching this with interest. We, who serve under the sign of the ship and wireless, typifying commerce and commercial information, have not been inefficient and twice I have been sent out to study the plans and report on the progress made by our competitors.

On my first trip seven years ago I reported that American mills controlled this trade but that Japanese mills were inaugurating an intelligent and aggressive campaign to win our market and that unless we got into closer touch with the consumer we would lose ground.

I have just returned from a second trip of study and observation and have to report that the Japanese cotton mills are now firmly entrenched in Manchuria, that they have captured a good portion of our trade, and that it is going to take our best efforts to hold the position we now have.

This commercial contest in far-off Manchuria is of direct interest to members of the Southern Textile Association, for our export cottons are mainly made in southern mills. In China, as you know, cloth is sold on the guarantee of weight and quality afforded by the trademark or "chop." The most widely sold American sheetings in Manchuria today are those bearing the "Horse & Dog" chop of the Loray mills of Gastonia, N. C., and the "Three Rabbit" chop of the Abbeville mills, Abbeville, S. C., but in addition one sees the chops of the Piedmont, the Pacolet, the Pelzer, the Whitney, the Massachusetts, the Union-Buffalo, the Enoree, the Enterprise, the Graniteville, and several others from this section.

In that land on the other side of the world there are millions of Chinese who would not recognize the name of a single one of your mills and who have but the faintest idea as to the location of America, in fact many of them still hold that the world is flat, and yet your chops are as familiar to them as old friends and they know what each stands for. Such is the reputation of the goods made today that we still sell millions of dollars worth of cloth in competition with Japanese cloths that are of the same nominal weight and much cheaper in price. The pressure of the flood of cheaper goods from Japan is, however, yearly becoming harder to resist, especially as the bulk of the ultimate consumers are tillers of the soil who work for a mere pittance, and it behooves both our manufacturers and exporters to make a close study of the methods of manufacture and of distribution that are used by our competitors.

W. A. GRAHAM CLARK.

Now who are our competitors and why is it that their goods are so much cheaper? There are several Japanese cotton mills competing with us for this trade in Manchuria and North China, but there are only three that stand out prominently—the Kanegafuchi, the Miye, and the Osaka. These are the three largest weaving mills of Japan. The Kanegafuchi is the recognized leader and one of the largest textile companies in the world, so that a few figures as to its capacity may be of interest. The Kanegafuchi Spinning Company, Ltd. operates 15 cotton mills that are spread over a distance of 825 miles from Tokyo to Kumamoto, and that contain 406,856 spinning spindles, 51,448 twister spindles, and 4,475 looms. The Kanegafuchi employs altogether some 28,000 operatives. It uses annually 250,000 bales of cotton, of which about 66 per cent are Indian, 30 per cent American, 3 per cent Chinese, and 1 per cent Egyptian. About a fourth of its total yarn production is exported and

a large amount sold to hand loom workers in Japan, but its annual cloth production is over 75,000,000 yards. Of its cloth production some two-thirds is sheeting and this is mainly for export; it also makes large quantities of 30-inch print cloth and 44-inch shirting, besides a small amount of drill. The paid-up capital stock of the Kanegafuchi is over $6,000,000, and the reserve funds amount to over $3,500,000; it is paying 16 per cent dividends.

Of the other two companies mentioned, the Miye has 272,824 spindles and 5,312 looms, while the Osaka has 134,340 spindles and 4,554 looms. It is seen that these companies would be accounted large even in America.

The Japanese mills have some disadvantages as a competitor with American mills but many other advantages in their favor. Due to the fact that they have to import all their machinery from the other side of the world and in addition have to expend large amounts for housing and caring for their help the first cost of a mill in Japan is much higher than in the United States. The great bulk of the cotton used has to come considerable distances and with the rate at which their spindles, working night and day on coarse counts, devour cotton this necessitates considerable stocks being kept on hand at all times. The amount of money thus tied up in raw material, together with the high first cost of their mills, makes necessary a larger capitalization, both for fixed and working capital, than is required in most other countries where raised, amounting to over 2 cents a pound more in the case of American cotton; taxes are higher; and their system of transient girl workers not only makes it difficult to build up a force of trained help, but requires a rather large expense item in recruiting fresh labor every year. They have also been greatly hampered in building up their trade by lack of capital and lack of experience but these latter are now being rapidly remedied.

On the other hand they have been much favored by extremely cheap labor and by the absence of any government restrictions as to the hours of labor and they are enabled to keep down their raw material cost by the mixing of different cottons and thus setting off the price of one cotton against another in a way that is not possible in most other countries making higher class goods that require the use of one kind of cotton only and which are thus dependent on any fluctuations in the price of this cotton.

The newer Japanese mills are well built and equipped, they are mostly only one-story in height and built of brick with stone or cement floors. The great bulk of their machinery of all kinds is obtained from England. They use the internal-fired boiler of the English type and usually employ rope driving. Several of the larger ones are now turning to the use of steam turbines for generating electric power. In the picker room they usually employ a Crighton opener which is especially favored for Indian and other cottons that contain much dirt and trash. Both card and spinning rooms are equipped almost entirely with English machinery. They use few mules and their ring frames are mostly long, 360 to 400 spindles each, and have the English system of one leather-covered front roller and two bare iron self-weighted back rollers. Their looms are mainly but not entirely English. At one mill I saw 600 American automatic looms being operated as plain looms. The manager said his yarn was so weak and his loomfixers so inefficient that he had to remove not only the warp stop-motions but also the filling batteries in order to obtain production.

Two Japanese mills spin up to No. 11, but the average count spun is around No. 23 and over half of the total production consists of two counts only—No. 16 weft and No. 20 warp. In making the small amount they require of high count yarns they have to use the best Egyptian. From 42's to 50's or 60's, they use Mississippi Peelers of 1 3/16 to 1 5/16 inch staple mixed with Egyptian cotton of the same length. For 38's to 42's they use Peeler cotton of 1 1/8 to 1 3/16 inch staple. From about 28's to 38's there is required American Uplands of Good Middling to Middling Fair. Below 28's the yarns are usually made from a mixture of two or more cottons but the mixings vary considerably from mill to mill and from time to time according not only to the standard of quality desired but also according to the relative prices ruling for the various cottons. Ordinarily American cotton is not employed in any yarns under 16's and these lower counts are made from Indian, Chinese, and other Eastern cottons. In making 16's and 20's the main material is Indian cotton and this is mixed with an eighth to a fourth of American cotton, and sometimes with the better grades of Chinese.

Chinese cotton is white but has no special luster while Indian cottons mostly have a brownish tinge, and both are harsh. American cotton is stronger, softer and more lustrous and not only improves the spinning qualities but enables a better price to be obtained for the resultant yarns in which it is mixed. With its high relative price, however, they use no more American than is necessary and the main requirement of a manager is skill in obtaining the cheapest mixture permissible for the kind of goods to be made. Relative prices vary but as a rule Indian cotton will be found to average about 2 cents a pound lower than American and Chinese to average about 2 cents a pound lower than Indian, when landed at the mill.

In mixing these various cottons some mills mix at the bin by taking armfuls alternately from a selected number of bales of the different kinds while others run each cotton separately into laps and then mix these on the lappers in the ratio desired. This latter is preferable where trashy cottons are to be mixed with cleaner ones of the same staple. Considerable skill is shown by the Japanese in making these mixings, but of course the staples of the cottons to be mixed have to be approximately the same. They say that low grade Indian and Chinese cottons of 5/8 to 3/4 inch staples mix readily; also that American Uplands can be mixed with Indian Tinnevelly or Broach and with Chinese Tungchow as all of these have about the same staple of 7/8 to 1 inch in length.

Nearly all the Japanese mills condition their yarns for weaving as well as for sale and the addition of this moisture not only makes the yarn weave better but much increases the profit on the yarn sold. The Japanese managers use English machinery and largely follow English methods so they not only condition their yarns but also size their cloths as heavily as is permissible. An analysis of Japanese cloths show that the mills do not depend entirely on their cheaper labor but use every other advantage possible and in imitating American goods they use less cotton and more sizing to obtain the same nominal weight. For instance the ordinary 36-inch American sheeting has 48 x 48 ends per inch and uses about 13's warp and 14's filling. The Japanese construct similar 36-inch sheeting with 44 x 44 ends per inch and use about 13's warp and 16's filling. Our cloth carries about 5 per cent sizing on the finished

cloth as against about 17 per cent on the Japanese. Except for the use of these additional advantages they could not undersell our cloth to anything like the extent that they do, even though they have very cheap labor.

Japanese labor though cheap, is inefficient. The great bulk of their operatives, some 85 per cent, are women and girls. Wages are so low that the mills in the cities are unable to secure much local help and have to employ recruiting officers regularly to scour the country districts and to bring in girls from farms 200 miles or more away from the manufacturing centers. These girls are mostly engaged on three year contracts. On arrival at the mill most of them are housed in working barracks inside the mill compound. These wooden buildings are constructed in the usual Japanese style and 12 to 15 girls sleep in each room. The floor is covered with a "Tatami" of close woven matting spread over thick soft straw. The girls sleep in rows on this floor, each having her sleeping quilt and a wooden neck rest.

The rooms have no furniture or pictures and when the girls have stored away their sleeping quilts in cupboards hidden in the partitions the sliding panels of sandpapered wood and oiled paper are slid back in the inner and outer walls and permit the free circulation of air during the day through an absolutely bare room. At the rear of the building is a large cement lined bath sunk in the floor and here the girls after their work bathe together in scalding hot water such as is customary in Japan but the temperature of which would take the skin off of a European not brought up to it. Each batch of girls is under the charge of a matron and they are rarely allowed to see any visitors or go outside of the mill compound. This is to avoid their running away or being enticed away by agents of other mills and those that do get away are usually found and returned by the police.

The work is so confining and the hours so long that the great bulk of these country girls quit as soon as their contract is up and have to be replaced by others. Many of them only come to the mills to obtain money for their trousseau. In spite of the increasing population of Japan, the enlarging mills find difficulty in obtaining sufficient labor and one mill at Osaka is now experimenting with girls brought from as far off as northern Korea. The mills maintain their own hospitals and some of them have their own theaters inside of the mill compounds, where they give occasional performances; they use every means they can to induce their help to stay, short of increasing wages or shortening hours. The mill usually furnishes food at nominal charge of about 6 cents a day, this consisting mainly of rice and vegetables with occasionally fish or meat. The girls dress in the usual Japanese style in kimonas, never employ any head covering, and wear cloth socks with a partition for the big toe. Out of doors they use wooden clogs but these are shuffled off and left at the door when entering the building.

There is no child age limit in Japan and many of these girls are under 12 years of age and the majority under 18. By the time they begin to attain any degree of skill they usually leave so that much of the time of the foreman is spent in training green help. The majority of the spinners on coarse and medium yarns tend only one side of about 200 spindles each, they are paid by weight and average about 15 cents a day. In the weave sheds the usual rule is only two looms to the weaver, only a few of the more skilled ones running three. On ordinary 36-inch sheeting, made with 44 picks to the inch, the usual weaving rate is about 7½ cents a cut of 40 yards. The wages of all operatives in Japanese cotton mills averages 20 cents a day. This is a large advance on the wages of 1888, which averaged less than 6 cents, but even at the same rate of increase it would require at least half a century for the Japanese operatives to average as much as does the American operative today.

Japanese spinning mills work night and day, which is a condition that obtains regularly in no other country. Not only that, but there are no Sundays or weekly half-holidays. A few of the mills now stop four days in the month but most of them only every tenth day or every fifteenth day. At every period of stoppage the day and night shifts are alternated, there being no restriction as to the night work of women and children any more than there is of the men. In considering the advantages of Japanese mills one of the most important cost reducers is this almost continuous operation of the spinning mills whereby the fixed overhead charges are spread over twice as much production as would be the case with mills operated only in the daytime as in other countries. Girls in the spinning mills work a 12-hour day or a 12-hour night, but as the weave sheds cannot advantageously be operated at night they employ only one shift and work this shift from 13 to 14 hours.

In the United States where wages are high the main object is to obtain the maximum production from each operative and so we run at moderate speeds and give each operative as much machinery as he can manage. In Japan where wages are low the main object is to obtain the maximum production from each machine that is possible with the grade of material used and so they operate their machinery as continuously and at as high speed as possible and give to each machine as many operatives as is necessary for the result desired.

With less than 25,000 power looms it would seem that the Japanese cloth competition cannot be very severe, especially as they import little cloth for their home requirements, but it should be remembered that there are in Japan 3 or 4 hundred thousand handlooms and that these supply a large portion of the home demand and leave the bulk of the power looms free to compete abroad.

The Japanese export of yarn is so large that as an exporter of cotton manfactures of all kinds Japan ranks only after England, Germany and France, and is ahead of the United States. In the item of cloth our exports are still nearly twice as valuable as those from Japan but they concentrate their cloth shipments almost entirely on the one market of China and in Manchuria, for instance, they now sell almost twice as much cloth as does the United States.

Conditions in the countries referred to in Special Agents' Series Nos. 80, 82 and 83 were found to vary with the different countries. In British East Africa the United States dominates the trade in the principal article sold—unbleached cotton goods. In Uganda, too, its share is large. In German East Africa, whose requirements are quite similar to those of British East Africa and Uganda, American goods do not figure so largely, while in Zanzibar the share is likewise small. In Portuguese East Africa the trade of the United States is negligible, and in South Africa it is almost insignificant in comparison with the total business done.

Mill Conditions and Market Reviews.

SOUTHERN MILL SITUATION.

As the chances for an early adjournment of Congress seem more probable, it is believed that the time has come to be conservatively optimistic regarding business conditions,—to worry less and to hope more, as, while general business continues quiet, the disposition is to become more hopeful. The more optimistic temper which now prevails is seemingly well justified, and unless politics prevent, should lead to greater activity later on. Cheap money and good crops are almost irresistible creators of optimism. Agricultural conditions as a whole are unusually promising for an abundant harvest, and there is ample margin to allow for customary deterioration and still provide large crops, which will prove the most effective stimulus to business in the south and west.

The Bureau of Statistics, United States Department of Agriculture, has made a revision of its preliminary estimates of cotton acreage last year (1913), based upon results of a special investigation and the report of the Bureau of the Census of the quantity of cotton ginned in the past season. This revision indicates that the area planted in cotton, (in cultivation at the end of June, 1913) was about 37,458,000 acres, instead of 35,622,000 as reported last July. The revised estimate will be used by the Bureau of Statistics as a basis in making its cotton acreage estimates this year.

The yield of cotton an acre in 1913 is estimated at 182 pounds in 1911, 170.7 pounds in 1910, and 154.3 pounds in 1909. The area picked in 1913 was about 37,089,000 acres.

The government's revised estimate, making the acreage planted in cotton as of July 1, 1913, 37,458,000 acres, or 1,836,000 acres more than estimated at the time, did not come as a great surprise to the trade. According to this estimate, the area devoted to cotton cultivation last year was the largest on record, exceeding that of 1911, the previous record year, by 1,483,000 acres. It confirms the view held for some time; namely, that the Department of Agriculture made a big underestimate of the crop in December by reason of the fact that its figures were based on too low an estimate of the acreage planted.

Owing to the high price for the staple last season, and the consequent profit to farmers generally, it is conceded that a substantial increase in acreage is certain. Various private authorities have estimated that it will be from 1.5 per cent to 3.6 per cent. On the basis of a 3 per cent increase, the acreage this year should amount to 38,550,840 acres, a 3.5 per cent increase to 38,737,980 and a 4 per cent increase to 38,925,120.

The yield an acre last season was about normal, being 182 pounds, notwithstanding the severe summer drought. On the basis of the same yield to an acre next season, an increase of 3 per cent in acreage would suggest an increase of about 425,000 bales net in the amount of cotton produced as compared with 1913-14.

The Southern Railway Co., through Col. M. V. Richards, head of the Land and Industrial Department, has issued the annual folder gotten out by this company, giving a list of the cotton mills along the lines operated by that company. The list for 1914 has just been printed, and shows a total of 790 textile plants. These mills operate 9,369,634 spindles and 208,744 looms. The figures serve to indicate the industrial development of the territory through which the lines of the Southern run. An item of special interest gleaned from the Southern's textile directory for 1914 is that this road operates what is known as daily cotton goods trains from Spencer, N. C., to points in the West. The peach trains and the melon trains are operated during the summer only, but the cotton goods train is an every-day-in-the-year affair.

On being interviewed by COTTON'S representative, as to the business outlook with special reference to the cotton damask trade, JNO. L. PATTERSON, Manager of the Rosemary Mfg. Co., at Roanoke Rapids, N. C., said:

"The market conditions of our particular class of product has not been at all good for the past six months, and is very bad now. I will not attempt to give at length my idea of what is the specific trouble with the market, but will only say that there have been so many disturbing elements and influences on trade for the past year, the spirit of uncertainty causing a lack of confidence in business in general, has existed, and the entire cotton goods trade has been badly affected, as have nearly all other lines of business in the United States.

"I have tried at all times to be an optimist, and firmly believe that as soon as the new currency system is in operation, the Mexican affair reaches some definite basis, the railroad rate question settled, and Congress adjourns, a spirit of confidence will appear and the dry goods markets will resume a healthy condition.

"The unfavorable weather in the South for the past few weeks, causing the price of cotton to rise rapidly, is an unfortunate condition for the cotton mills. Although this rapid rise in the price of cotton has stimulated, temporarily, more trade, it will eventually prove harmful to the mills, as their profits are of course a difference between the cost of manufacture, including cotton, and the selling price. If cotton remains at its present level of price, or goes still higher, as indications point now, it will be impossible to raise the selling price of the goods in anything like the same proportion as the rise in price of cotton, and the profits of the mills with a good volume of business will be greatly reduced. The immediate outlook for the cotton mills of the South is certainly not bright."

At the recent meeting of the National Foreign Trade Convention held in Washington, "Commercial Conditions in Southern States with Special Reference to Foreign Trade," were reported upon by Capt. Ellison A. Smyth, President of the South Carolina Cotton Manufacturers' Association.

He stated that with three times as large a production of cotton as in 1860, and with a selling price which has doubled, the southern states are in a particularly advantageous position for the development of foreign trade. He said further that aside from shipments of raw cotton there was a constantly widening field for export of cotton fabrics,—a world's trade, which amounted to some $1,200,000,000 an-

nually. The United States, with 22 per cent of the spindles, and two-thirds of the raw material, was cutting into this huge trade to the extent of only 5 per cent annually.

He pointed to Africa and the Philippines as the most promising field for present development of export trade from the southern states. Africa, with a population of 170,000,000, or more than that of North and South America combined, promised, in his opinion, to be one of the largest markets for cotton goods in the world, principally since climatic conditions make cotton the principal material for clothing. "It is a field," he stated, "well worth the attention of American cotton manufacturers."

Our exports in cotton goods to the Philippines during the past year have increased 100 per cent; a trade in which the southern cotton mills hold a commanding position. Capt. Smyth concluded his talk by saying that the situation of our export trade calls for a cooperative and well organized campaign to not only hold the business we now have, but to enlarge it, and the southern cotton mills who are now prepared to cater to the export trade are not only willing but anxious to join in any effort that will lead to greater development and greater volume of the export trade.

At the meeting above mentioned there was planned a campaign which would seem to be constructive throughout. There would be a council of thirty members of the new organization to coordinate industrial, transportation and financial interests behind projects for foreign trade; Congress would be impressed as far as possible with the advisability of permitting combinations for the development of foreign commerce as distinct from domestic. The members stand pledged now to measures for a more efficient consular and diplomatic service, to increased appropriations for the trade promotion activities of the Department of Commerce, to the upbuilding of the American merchant marine, and to approval of the manufacturing census which will be taken this year. There is strong merit, we believe, in every one of the recommendations made.

We note in a recent issue of the Manchuria Daily News, "That Japanese cottons imported into Manchuria increased by 60 per cent during last year seems to have aroused the attention of foreign importers. We understand that the present visit of W. A. Graham Clark, an American Commercial Agent, to Manchuria and China is to study the exact requirements of the Chinese consumers with a view to expanding the markets for American imports.

"The increase of Japanese manufactures is a result of its becoming a commercial feasibility to produce in Japan since last year jeans, calico, etc., which used to be regarded by the Japanese spinning world as prohibitive. This change was introduced by the revision of the customs tariff in 1909. At present Japan supplies 65 per cent of the demands in Manchuria, the remainder being divided between American, British and Chinese manufacturers."

On June 9th the ninth annual convention of the Cotton Manufacturers' Association of North Carolina was held in Charlotte, N. C. The meeting was presided over by C. E. Hutchison, of Mount Holly, president of the association. The theme of the meeting was in reference to child labor, it being deemed advisable to appoint a committee somewhat in the nature of a Publicity Committee to place the position of the manufacturers on this question to the public in the proper light. It was the idea of the members present that the age limit should be raised one year, instead of being lowered, as it has been claimed they wished to do. There was a large attendance, and much interest was manifested.

The date and place for the next national Textile Exhibition were not decided upon at the annual meeting of the Textile Exhibitors' Association, which was held at Danvers, Mass., on June 8th. Atlanta is bidding for the next exhibition, and a petition with the signatures of several hundred southern cotton manufacturers secured by COTTON was read at the meeting. The directors, however, left the matter open for further investigation by Secretary Chester I. Campbell. The reports of the various committees showed the association to be in a flourishing condition. The report on the fourth national textile exhibition, recently held in Boston, showed that the exhibition was a financial success.

Of interest to the trade is the resignation of Thomas Barrett, Jr., as head of the Langley Mfg. Co., at Langley, S. C. The resignation has been tendered to take effect at once. Mr. Barrett's resignation also carried with it his resignation as president of the Aiken Mfg. Co., Bath, S. C., and the Seminole Mfg. Co., of Clearwater, S. C. The following statement was given out at the local office of the company, covering Mr. Barrett's action, and the future plans of the company:

"Arrangements have been made to extend the interests of the Langley Mfg. Co., and a meeting of the stockholders has been called for June 15th to authorize an issue of $60,000 bonds, with which to improve the present plant and to provide further capital. The board of directors has carefully considered such changes as will place the mill on a more profitable basis, and has proposed plans which have been approved by the directors as well as parties having large financial interests in the company. At a meeting here Mr. Barrett tendered his resignation, stating that he desired to be removed from active management in order to devote more time to his other interests. George R. Lombard has been appointed temporary chairman of the board of directors, no successor to Mr. Barrett having yet been chosen."

The Woodruff Cotton Mills have placed order for 7,625 additional spindles, with complementary machinery.

The Bibb Mfg. Co., Macon, Ga., are planning to add to their equipment, order for card room machinery having been placed.

The Brevard Cotton Mills, Brevard, N. C., are adding card room machinery.

The Virginia Cotton Mills, Swepsonville, N. C., have placed order for additional cards and spoolers.

The Elberton (Ga.) Mfg. Co., has been incorporated to succeed the Home Cotton Mills, with a capital stock of $100,000, and will organize.

The Riverside Mills, at Worthville, N. C., will install 2,000 spindles to replace old machinery, contract having been let for this machinery.

Progress is being made on the building of the Clinton Mills Co., at Emporia, Va., to contain an equipment of 5,000 spindles, 10 looms, electrical drive power, etc., for manufacturing cotton cloth. This product will be used for manufacturing water wings (a safety swimming device) by the Ayvaid Mfg. Co., of Hoboken, N. J.

From Columbia, S. C., comes the report that the secretary of state has issued a charter to the Prospect Mills of Batesville, with a capital of $25,000. The officers are: MacMillan C. King, president, and E. J. DeCamps, vice-president, secretary and treasurer.

NEW ENGLAND MILL SITUATION.

The failure of the H. B. Claflin Company, which was announced on Thursday, June 25, was a serious shock to the manufacturing industries of New England and to the banks of the section as well. Manufacturing interests have maintained close connections with this large institution for many years and the banks of the section have purchased the commercial paper of the house liberally. Many goods are due to the company on order and nearly all the regular customers of the house have more or less due them.

But the financial phases of the failure were hardly less disconcerting than the effect upon the market prospects. Trade had been slowly improving and hopes were high that the unequalled crops would soon bring a return of active business for mills of all kinds. The final effect of the failure can only be surmised but for the moment there is a very considerable hesitation in selling. Distribution is certain to be disorganized for a time until it is clear to what extent the influence of the failure will be felt in general trade.

The markets as a whole are steady and if no liquidation is forced it is believed in the best informed circles that trade will begin to move along again in a healthier way toward the end of the month. The most disturbing element in the situation so far as the Claflin influence is concerned is the knowledge now made public that the company as a jobbing institution had not been profitable, but its earnings were dependent upon the financial assistance rendered to a chain of retail stores. Manufacturers have always commended Claflin paper to the banks and the financial institutions patronized by the mills of this section have invariably backed what is called "two name" commercial paper because of their full confidence in its integrity. They are now confronted with the certainty of a closer examination of their own paper and that of jobbers to whom they sell, and they fear that it may take some time to bring about a calm condition in mercantile circles.

On the day the failure of the largest eastern jobbing institution was announced, it was made public that a plan had been formulated for the adjustment of the affairs of the United States Finishing Company which failed a year ago and brought down two or three other dry goods concerns with it. Stockholders and creditors have accepted a reorganization plan that virtually insures an extension of the indebtedness on a scale that will make it possible to handle it readily without in any way interfering with the quick capital needed in operating the five large plants of the company. At the present time the company has on order 40,000 pieces more than a year ago and the printing departments of the plants are being operated in full, and one of them at Norwich, Conn., is running nights.

The printers of fine goods are very active. The Arnold and Pacific works are busier than they have been for some years on all kinds of fine sheer fabrics for dress purposes, and the Windsor works have had the most successful year in their history. The Algonquin and American printing companies are busy on staple work and have moderate orders in hand for July and August delivery. The bleacheries have been quite busy on orders taken in the early part of the month and while they could do more, they are not complaining.

The machine shops are running light and general financial conditions are such that they do not see very bright prospects ahead. Several of them have orders in hand for new mills and for the reequipment of old ones but there is no great rush on them. The Draper Company is busy on a large order for the Fall River Iron Works Mills and has also been receiving small business steadily for several established plants. The demand for wide looms continues to overshadow the call for narrow looms, which are being thrown out very fast in this section. The call for fancy looms and attachments is not so great as a year ago.

Friday morning early (June 26), fire destroyed the great mill of the Naumkeag Company at Salem, Mass., in the course of a conflagration that swept through more than half the city. The plant contained 105,000 spindles and 2,770 looms for the production of sheetings and sateens. It was in this mill that the famous Pequot sheetings and Naumkeag twills were made. The plant has been completely renewed in recent years and was on a money making basis with its product bespoken for many weeks ahead. The loss of this property is certain to have an acute influence in the wide sheeting markets as wide sheetings have been none too plentiful for more than a year. It is too early to say whether the property will be rebuilt on the old site. The loss will fall on the factory insurance companies and it is the first great loss sustained by the total destruction of a large mill in a great many years. The money loss is estimated now at $2,000,000.

The next merchandise movement that is awaited with interest in this section is the opening of dress ginghams for spring. The Amoskeag Company, which is the largest producer, does not expect to name prices until the middle of the month. It is thought that the new prices will be a little higher than those of last year, this inference on the part of buyers being drawn from the fact that the company has done a large business on shirting chambreys, and romper cloths for spring at very close prices. The demand for ginghams does not promise to be large and it is thought that the mills will name a price that will show a profit on small sales, rather than trying to force a demand at this time by low values. Most of the gingham mills are offering novelties and specialties and do not look forward to a large dress gingham business early in the coming season. They do anticipate that with the development of such a marked demand for printed goods as has been noted will eventually be reflected in a larger call for ginghams. Just now the best selling cloths are the finer grades for fall.

The print cloth situation has not improved much during the month. The activity of the early part of the month petered out and came to a standstill at the close of the past week, and values began to show some easing. Fall River mills are sold for the months of July and August for about half their output and are carrying total stocks of about a million and a quarter pieces of all kinds of goods. There are about 15 per cent of the looms idle and further curtailment is looked for unless the Claflin affairs take a great change early next month.

At New Bedford, about 17,000 looms are idle for lack of business. The wide plain looms are fairly well employed on fine lawns, voiles, organdies, and crepes. There is less fancy business offering for spring than is usual. Goods for printing purposes for spot delivery have been bought freely. The demand for narrow loom products is light in either plain or fancy. There has been some improvement in prices from the extremely low values of the year. Fine staple cotton is scarce and high and mills using it declare that they must get better prices for goods from yarns of 60's warp

or over, or they will have to pass the business until cotton is cheaper.

Throughout the section there is considerable idleness of which little is being said. The disposition of manufacturers is to shut down looms as orders are filled and not accumulate anything in excess of firm orders. This is due in some part to the uncertainty in fabric styles. A year ago the mills were being overwhelmed with business for heavy fancy goods. This year the demand has completely switched and the call now is for sheer fine fabrics, the sheerer the better. Leno weaves and mock lenos are particularly desirable for spring for printing and dyeing. But there are not many mills that care to accept the very fine fancy business on organdies and fine lenos, so that as a total effect in supplying business for the mass of looms, the new style change is not yet perceptible.

Business on towels and quilts is lighter than it has been in three or four years. Deliveries can now be made promptly by all of the mills and there is but one quilt mill in the section that apparently has plenty of business. The Stevens quilt mill at Fall River, which is the largest American concern, is running four days a week, and the Bates mill is not very busy.

Some of the fine yarn mills making special qualities for the automobile trade and for the very fine weaving trades, are getting business enough to keep them employed. But the mills that make average numbers and medium qualities are complaining of a very light business. Yarn mills that are generally pretty steadily employed on yarns for the dress goods and men's wear trades are finding business lighter at the present time than for some years past. Two of the plants of the New England Cotton Yarn Company's mills are shut down completely and parts of many other mills are stopped.

Mills making blankets and napped goods sold their products freely in the early part of the year. There has been some holding back in deliveries owing to the desire of jobbers to await actual business for fall before hurrying goods out. The mills are all well employed and are generally in a better position than mills making other staples. The mills at work on denims, working suit goods, and tickings are moderately well employed for the next two months but late business is slow in coming from the jobbers.

Nearly all manufacturers are complaining of the small margin of profit on which they are working and many of them are quite content to shut down for summer vacations when they get an opportunity. If the managers could see beyond the unavoidable hesitation that must result from the Claflin failure many of them believe that the good crops would bring on an active fall demand that might lift prices to a more satisfactory level.

COTTON CROP CONDITIONS AND A REVIEW OF THE MARKET.

BY H. AND B. BEER, NEW ORLEANS.

One month ago we stated that the Texas crop was very backward, later than for many years past, and that planting would not be finished until about June 1st, even if good weather prevailed. Instead of the weather improving in the southwest, the rains continued in Texas until June 1st, during which period little or no planting could be done, and farmers were unable to cultivate the early planting. The result was that conditions continued to grow worse, and as was reported by the Government Bureau, the condition of the crop in Texas on May 25th (65) was the lowest on record for that state, and the general average condition of the crop for the entire belt (74.3) was the lowest, with one exception (1907) since the Sully year of 1903.

Reflecting such conditions cotton for future delivery scored an advance of about $5 per bale during the last half of May, and spot cotton advanced in the South to about 14 cents for middling.

Climatic conditions in the western half of the belt, particularly in Texas, have been more favorable during the first three weeks of June, fair and warmer weather having been the rule. In order that advantage should be taken of the return of good weather, courts have adjourned and merchants have closed their stores at a number of points, in order to assist the farmers to clean their fields and complete the planting of their cotton in Texas. Today seeding is nearing completion and although the season is very late, the outlook for an average crop in Texas is more hopeful.

Just as conditions were improving in the west, the eastern half of the cotton region commenced to complain of the want of rain, excessive temperatures made their appearance in Alabama and the South Atlantic states, breaking previous records for drouth and heat for so early in the summer. Some deterioration was reported and the situation, owing to the want of moisture assumed a threatening appearance. However, by the middle of June showers made their appearance to the east of the Mississippi River, gradually spread and became heavier, finally winding up in a general heavy rain over Alabama, Georgia and the Carolinas on the 18th inst., effectually breaking the long and severe drouth.

As the present situation stands, the west is just recovering from a protracted spell of wet weather, breaking previous records, and the east has just been relieved from the effects of a drouth, which, for duration, has broken all records. Under such conditions the crop has not been able to make satisfactory progress, and as the weevils are reported to have appeared in the infested territory at an unusually early date and in large numbers, there is much uneasiness in the central and western portions of the belt on that account.

As to the acreage, opinions are divided as to whether or not there is a decrease or an increase. Some people claim that there is an increase of nearly 5 per cent this year, some persons contend that there will be no change from last year's area, and others believe that the official report will show a decrease in the acreage this year. The Government report on the acreage devoted to cotton this year will be issued July 1st.

Due to the breaking of the drouth in the eastern half of the belt, and the more favorable weather and crop reports from the western half of the cotton region, the market experienced a sharp decline during the past few days, but we do not think that the market will work much lower, as new crop deliveries are now a little below the 12.50 level, and any unfavorable circumstance would probably occasion another advance.

The crop will soon be entering the critical period, July and August, and unless good rains are had in these months, deterioration is apt to follow, especially in the central and eastern portions of the belt where the deficiency in rainfall this year is about 50 per cent of the normal.

THE KNIT GOODS MARKET.

The knit goods market for the past month continued to be somewhat quiet. Early in the month the New York State Underwear Manufacturers' Association met in Utica and laid plans toward the strengthening of their organization as the first step in an important program of business.

The newest samples in sweater coats are made of a closely knitted cloth of a woven appearance, such as has been used in knitted overcoats. These coats are light and are expected to be popular. The sweater business is very quiet, but many appear to have full confidence that the next season will develop a good business when merchandise is actually wanted by jobbers and retailers.

Some of the spring underwear lines which were opened up during the past month showed that more mills were making union suits, including men's 50 cents goods and boys' cheap garments. One large knit goods selling agency was showing such a garment for next season and reporting fair success this early. The price was said to be in the neighborhood of $3.50 a dozen. One of the cheapest boys' union suits in the market was reported to be priced at $1.80 a dozen. Many high priced garments are expected to be shown later.

Later in the month as other lines were opened and prices given out, there were indications that an effort was being made on the part of sellers to straighten up on prices and try and secure a portion of the advance in cost the mills have had to meet in manufacturing. Such an attitude, it is said, is made necessary by the higher cost of manufacturing at the present time. An interesting feature in the new hosiery line for next season was the readjustment made to meet the changing demand now being felt in this branch of knit goods. Mills had prepared their lines with the idea of concentrating on those styles that called for the most business during the past year. Members of the trade indicate that this summer will prove the real test of the all-fiber-silk hosiery question and if the public is satisfied with the wearing qualities, the business for next season will be heavier than ever.

The general business situation still seems quite hopeful, although some of the brokers' recent letters indicate that there is quite a large belief that the better business conditions hinge largely on the attitude of the administration at Washington and the adverse laws they are seemingly so anxious to inflict with all speed on the business world.

THE YARN MARKET.

The cotton yarn market for the past month may be classified as quiet but hopeful. Early in the month the stocks continued large and any curtailment such as had been rumored in many quarters, had not succeeded in producing any effect upon the market. Inquiries continued good, but the sales were not so good. Weavers were buying from hand to mouth, and the weaving situation didn't seem to show very much improvement. There was very little demand for 24's cones for prompt delivery, although there were some inquiries for fall delivery. Manufacturers of 220 to 260 needle women's goods were not busy, but makers of the cheaper lines were reported to be doing a good business. The demand for combed yarn was light, and mercerized yarns have been quiet for so long that everyone has become accustomed to a lack of inquiries in that direction.

As the month closes receipts from the South continue large. Buyers of carded yarn are asking quick delivery, and the quantities range from a few cases up to probably 30. There were a few inquiries for yarns for fall delivery. In the combed yarns, there were inquiries for singles, and in many instances the price did not seem to be the chief object. Some Western knitters are reported to have already bought lots of 25,000 to 50,000 pounds of southern single combed peeler, and there are inquiries in the market for a few lots of 50,000 to 150,000 pounds of single combed peeler cones, from 14's to 40's. All kinds of prices are being received from 24½ cents, basis of 10's, southern frame spun combed peeler, to 28½ cents for eastern yarns. Weaving lines continued slow and any orders received were small ones. Mercerizers were reported to have bought 150,000 pounds of 40's two-ply and 60's two-ply southern frame spun combed peeler at 36 cents for the 40's two-ply and 47 cents for the 60's two-ply.

While the depression in textiles has been reported to be world-wide, and there seems to be some good foundation for much of the pessimistic talk that has been going the rounds in some parts of the textile circles, a recent trip through the Carolinas indicated that some fortunate mills were securing all the orders necessary to keep them in operation and were lit up and running until 12 o'clock at night. This is certainly not an indication of hard times, and is perhaps the reason why the South at the present time is the best market in the country for manufactured products of any description.

Following are recent quotations from the Philadelphia market:

Southern Single Skeins.

8s	18½ @19	16s	20½ @21
10s	19 @19½	20s	21½
12s	19 @20	26s	23 @23½
14s	20 @20½	30s	25½ @26

Southern Two-Ply Skeins.

4s to 8s	18½ @19½	24s	23 @23½
10s	19½ @20	26s	24
12s	20 @20½	30s	25½
14s	20 @21	40s	29 @29½
16s	20½ @21½	50s	35½ @36
20s	22	60s	45 @45½

Carpet and Upholstery Yarns in Skeins.

9-4 slack	19½ @20	8-4 slack	19 @19½
8-3-4 hard twist	17½ @18		

Southern Two-Ply Warps.

8s	18½ @19½	20s	22 @22½
10s	19½ @20	24s	23½ @24
12s	20½ @21	26s	24½
14s	21½ @22	30s	25½
16s	21½ @22½	18s	22 @23
		50s	36

Northern Two-Ply Carded Peeler Skeins.

8s	19 @19½	20s	21½ @22
22s	23½ @24	36s	28½ @29
24s	24 @24½	40s	30½ @31
26s	24½ @25	50s	37
30s	25½ @26	60s	45 @46

Two-Ply Combed Peeler Skeins.

20s	28½ @29	50s	43 @45
24s	30½ @31	60s	47 @54
30s	32 @33	70s	58 @63
40s	36 @40	80s	67 @71

Southern Frame Spun Yarn on Cones.

8s	19 @19½	20s	22½ @23½
10s	20 @21	22s	23 @23¾
12s	20½ @21½	24s	23 @24½
14s	21 @22	26s	24½ @25½
30s	25½ @26½		
18s	22 @23	30s	25½ @26½

Northern Mule Spun Carded Yarn on Cones.

4s to 8s	21½	20s	24½ @25
10s	22 @22½	22s	25 @25½
12s	22½ @23	24s	25½ @26
14s	23 @23½	26s	26 @26½
16s	23½ @24½	30s	27½ @28
18s	24 @24½	40s	32½ @33

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	26½ @27	22s	30 @30½
12s	27 @27½	24s	31 @31½
14s	27½ @28	26s	32 @32½
16s	28 @28½	30s	35 @35½
18s	28½ @29	36s	37 @38
20s	29 @29½	40s	40 @41

COTTON MANUFACTURING.

ROLL WEIGHTING AND SELF-WEIGHTING.

BY WILLIAM SHAW.

Roll drafting was the deficiency of the spinning-jenny, and it was Mr. Arkwright who supplied this deficiency by the invention of the spinning-frame, which spins a vast number of threads of any degree of fineness and hardness. At that time as now, the lower steel rolls were furrowed or fluted longitudinally, and the upper ones covered with leather.

Mr. Arkwright stated that he accidentally derived the first hint of his great invention from seeing a red-hot iron bar elongated by being made to pass between rolls and though there is no mechanical analogy between that operation and his process of spinning, it is not difficult to imagine that, by reflecting upon it and placing the subject in different points of view, he might be led by it to his invention.

The precise date of Mr. Arkwright's invention is not known. However, from the time of his invention to the present time, it has been understood that the top rolls were covered with leather to make them take hold of the cotton, and weighted for the same reason.

The reader may have noticed in the July, 1913, issue of COTTON a few questions from a new subscriber. The second and third questions asked by this gentleman prove that to the present time, roll drafting and roll weighting are not clearly understood, and too little attention has been given to it except by thoughtful and ambitious overseers.

It is my intention in this article to clarify some matters relating to roll weighting and drafting, and also give reasons why the Arkwright principle should be rejected.

There is no doubt that some readers will take exception to the above statement, but if the reader is a manufacturer and will closely follow what I point out in this article, and then prove what is said by tests, he will discover that the new way of drafting will make a stronger yarn with less consumption of power, and that the Arkwright principle of weighting the top rolls to make them take hold of the cotton is wrong when the functions of all top rolls are taken into consideration.

We never hear of anyone finding any hard ends in any process preceding the slubber; and why? Because on all drawing rolls preceding the slubber, the rolls are so heavily weighted as to make the grip stronger than any cotton fiber, so, instead of the top roll being checked by any long fiber, the fiber is broken.

How many manufacturers have given this point any consideration? How many fibers are broken in a cotton mill, using top leather rolls, at each process preceding the intermediate frame? If a fiber is strong enough to check the front roll on the frames preceding the slubber, would it not be a great aid in making a stronger yarn by equipping every machine preceding the intermediate with rolls that do not have as firm a grip as that of leather rolls and not as heavily weighted?

Metallic rolls will not break the long fibers for two reasons: first, they are not supported by the fibers; second, metal being smoother than leather, the longer fibers have a better opportunity to slip from under the action of the roll without being injured or broken, thus saving millions of fibers that are broken by the use of leather rolls.

The difference between metallic rolls and top leather rolls is, that the leather roll is made to hold the fibers by being supported by the fibers and also by dead weighting, while the metallic rolls do the work only by meshing and causing friction.

This is, of course, nothing new to most readers of COTTON, as metallic rolls and their principle is understood by almost every manufacturer, but what have we done for the processes following the slubber? When I say the Arkwright principle, I have reference to what he said about seeing a red-hot iron bar elongated by being made to pass between rollers, which, of course, necessitated the weighting of all rolls acting upon the bar. So most of us have for years followed Arkwright's principle. We know better now, at least, most thoughtful and ambitious carders do, for one can easily find where carders have removed the middle rolls on the fine frames and jacks.

Let us now first consider the Arkwright principle of drafting, which is by having the leather rolls weighted by weights and driven by frictional contact, and let us study what takes place between the top leather rolls on the first and second steel rolls.

In setting rolls, there is one broad principle that must always be followed; the distance between the centers of each pair of rolls must always exceed the average length of the staple of cotton being used. So, in this case, we will assume that the distance between the pair of rolls under consideration is 3/32 of an inch in excess of the average length of the staple. Again we will assume, that the rolls under consideration are those of the fine, jack, and ring frames.

I need not point out here, that in most cotton mills making carded yarns, the length of the staple varies. So when the rolls are weighted by weights the top leather rolls are made to take a firm grip on the stock. If a fiber is longer or nearly as long as the distance between the centers of the forward pairs of rolls, the fiber is broken or the front roll is checked, hence a hard end. To prove that there is a dual operation going on at all times between the first and second top leather rolls weighted by weights, change from fluffy or ordinary cotton to a more wiry cotton, and you will find that the bobbins will be more compact and also more hard ends will be found. What makes the bobbin more compact? You have the same number of turns around the horizontal presser, and it stands to reason, that if the top leather roll could stand the resistance which wiry cotton offers to it that the bobbin would be no harder than in the first case. But as stated, owing to the top leather rolls having both a firm grip on the stock and at the same time heavily weighted, the dual operation that takes place by the front top leather roll drawing the fibers from the second roll is too much for the driven contact of the front roll, which, of course, causes it to lag behind the surface speed of the front steel roll, and the strand is shortened, which makes the bobbin more compact.

This is what has puzzled builders of fly frames, and to this day no builder can construct a pair of cones to run all kinds of cotton—ask any builder.

You can, of course, put on a rack gear to accommodate the retardation of the front roll, but you have the retardation just the same, which means hard ends. Is this not an important subject for us all to consider?

Can any reader of this article deny that at times the weight of the section beams will jump twenty pounds on the heavy side and then drop to ten pounds on the light side, when at the same time no variation in the drawing finished sliver was noticed? This puzzled a good many carders, especially young carders, and even superintendents. Superintendents, as a rule, lay it to the contraction of twist, as they claim that the wiry cotton contracts more twist, which is true. But with the contraction of twist and the shortening of the strand by the front top leather roll being made to lag, causes a *double gain*, which accounts for the section beams taking such a jump at times.

This is an expensive item to any cotton mill, for although the cloth can be balanced somewhat with lighter filling, it is more expensive to make a lighter yarn.

Hard ends will break down many other ends and the evil most dreaded by speeder tenders. For instance, when a tender is creeling, one hard end will sweep down many more and make such a mess that in some cases it will discourage the tender and cause her to leave her work, especially in the summer months.

Another test which may easily be made, and one which will prove the principle of weighting all rolls mechanically to be wrong, is to twist the roving when creeling to the right instead of to the left, or make the piecing longer or nearly as long as the distance between the centers of the two forward rolls. A hard end will result in almost every case when wiry cotton is used. Some men conceive the idea that by adding more weight to the top rolls that more hard ends are eliminated, they never stop to think that when they add more weight the friction under the saddle is increased and the consumption of power to drive the frame is increased also. Therefore, up to the present time, many mills have the top rolls heavily weighted to help eliminate hard ends, but this is never attained for the reason stated.

The reasoning of adding more weight on the top rolls to eliminate hard ends is the same as making the clearer heavier to prevent the front roll from lapping. By adding more weight on the top rolls, you do of course make the grip stronger and firmer, but the friction that the extra weight occasions increases the retardation, and you have the same number of hard ends. This is why the question of roll weighting and setting comes up every little while.

The inventor of metallic rolls must have had in mind that rolls weighted and supported by fibers result in many being injured and broken. With metallic rolls the fibers being pulled and held by meshing only, the longer fibers would be drawn from the preceding roll without being injured because metal does not hold as firm a grip on the cotton. The draft is positive for the reason that the grip on the stock is always on the side of the roll where the power is conveyed to rotate the top roll, which is always at the back top side of the rolls, or where the stock is received. So in such a case, it should be seen, that the fibers have a better opportunity for slipping from a metal roll than from one covered with leather. This suggestion was also the "sparker" for this article, for from tests made, the only way I have discovered to eliminate hard ends entirely and at the same time have a positive draft, is by using metal rolls. It should be remembered also that a positive draft is a great help in remedying the unequal conditions found on all fly frames. By drafting by meshing only the rolls require less weighting and the consumption of power is greatly reduced.

Everyone knows that at times when the roving is on the heavy side, that the yarn will be found on the light side. This is due to fluffy cotton. The resistance offered to the front top leather roll is not as great, and the figured draft is nearly obtained. On the other hand, the roving is sometimes found on the light side and the yarn on the heavy side. This is due to wiry cotton.

The resistance offered by the harsh cotton to the rotation of the front roll greatly reduces its surface speed and this causes hard ends. Also, heavy yarn which causes the beams to jump many pounds over the standard weight. Even when no stock is passing under the action of weighted rolls, a certain amount of friction can be found on the front top leather roll. Weights will, themselves, create friction, and this, aided by the stock passing under their action, the rolls dry and dirty, worn saddles and poorly covered rolls, or rolls in poor condition, helps to make the unequal conditions found on fly frames. Can the reader advance a single argument for weighted rolls? Is it not a fact that the Arkwright principle is wrong from every point of view?

I will now give my ideas of how the drawing rolls should be arranged and weighted at every process. On all the drawing frames metallic rolls, weighted as follows, for a finished sliver under 40 grains per yard, and made from a carded sliver not over 40 grains per yard, 6 pounds weight on the front rolls, 8 pounds on the second and third, and 10 pounds on the back rolls. For a carded sliver not over 50 grains per yard and a finished drawing sliver not exceeding 50 grains per yard, add two pounds to the weighting given above.

On the slubbers for a finished drawing sliver not exceeding 40 grains per yard, four pounds on the front rolls, eight on the second, and ten on the back rolls. For a finished drawing sliver not exceeding 50 grains per yard, add two pounds to the above weighting.

On the intermediates, ball bearing top leather front rolls, metallic rolls on the second and back rolls, weighted as follows: ten pounds on the front rolls, eight on the second and back rolls. There are two reasons for the above weighting on the intermediates: (1) I give a heavier weighting for the front rolls to insure a better grip which insures a positive draft. Heavier weighting does not increase the friction, as the arbor on all ball bearing rolls is stationary. I give a lighter weighting for the second and back rolls, because I have found that eight pounds was enough to make the draft positive and at the same time allow the longer fibers to escape without being injured or broken.

It should be borne in mind what was said regarding the grip of the metallic rolls being on the flutes drawing the stock from the preceding roll. With the arrangement and weighting given it should be clear to the reader that the firm grip of the leather rolls have every opportunity of drawing all fibers longer than the average length under action, for the reason that they have a firm grip on the center of the front rolls, and a tendency to allow the fibers to escape on the second rolls.

On all fly frames and ring frames, ball bearing top leather front rolls, weighted as follows: on the fine frame eight pounds on the front rolls, on the jack six pounds on the front rolls, and on the ring frames four pounds on the front rolls. On the second steel roll for the fine and jack frames have self-weighted rolls. On the middle roll have a smooth metal roll (not furrowed) having the same diameter as that of the middle bottom steel rolls. On the back roll, have a smooth metal roll the same as on the middle roll, only make it ⅛ of an inch larger in diameter than the middle roll. The reason for the weighting given is to have the back roll somewhat condense or flatten the roving, and at the same time insure grip enough so as to keep the strand between the middle and back rolls tight at all times as it should be, and not allow the strand to become slack and work out to the side of the rolls.

On the ring frames; have the same type of metal roll for the middle roll, and the same diameter as the bottom steel roll. On the back roll have the same type of smooth metal roll, but ½ inch larger in diameter than the bottom steel roll for the reason given for the fine and jack frames.

Let us stop here and reason what would take place with such a "hang up" as outlined. By having a self weighted roll on the middle steel roll on the fine and jack, and a ball bearing top leather roll on the front roll, the dual operation which takes place in case of all leather top rolls is destroyed, and hard ends and irregular drafting is entirely eliminated. The size of the smooth metal rolls given above, will be found heavy enough to insure a positive draft, and at the same time allow the longer fibers to escape. The reader may be a bit skeptical on the above point, and may feel that if metal rolls will allow the longer fibers to escape, that the same argument would hold good with the shorter fibers, but such is not the case. The distance between the centers of each pair of rolls as stated, must always exceed the average length of the staple of cotton being used. Therefore, the metal self weighted roll is enough to hold the fibers and not allow them to escape in clusters. But in case of a longer fiber, the metal roll having a smooth surface has not as firm a grip as that of a leather roll, and besides, the front roll being of the ball bearing type, practically free from friction and rotating at all times at the same surface speed as that of the front steel roll, has always strength enough to pull all longer fibers from under the action of the middle metal roll without breaking or even injuring them. I have this "hang-up" on my fine, jack, and ring frames, and never had one hard end or cockled yarn since they were installed.

When creeling you can twist the roving in either direction without making hard ends. You can also make the piecing as long as you like and no hard ends will result.

To prove my reasoning, if the reader has ever had the opportunity to see a slubber equipped with metallic rolls in operation no hard ends will result when the drawing is pieced at the back of the slubber. With leather rolls, if a careless and poor piecing is made, a hard end will result in almost every case. Eighty per cent of the trouble in any cotton mill results from the drawing rolls, and the trouble is that the front roll and second roll have too firm a grip, and both at the same time, on the cotton. It is the cause of hard ends, uneven work, and the cause of the beams varying from the standard weight. It is also impossible to have a fixed distance between the rolls for the same hank roving and number of yarn.

When a person inquires of a textile journal how rolls should be set for a certain length of staple they fail in every case to give the draft. The length of the draft is most important as is also the nature of the stock. One may as well ask how much twist should be inserted in a certain number of roving or yarn. It is impossible to answer such questions without having the opportunity of sampling the stock run.

When the drawing rolls are arranged as in the "hang-up" outlined, we have only the pressure of the paddle to consider when the cones are modified which can be controlled with tolerable ease when all frictional contact is removed from the top front roll.

To prove what is stated in this article let the reader make the following test:

First, run a light hank roving. Do not have the finished drawing sliver heavier than 50 grains per yard when making 40's yarn. Run a one-hank roving on the slubber, three-hank on the intermediates, and seven-hank on the fine frames or jacks.

Now have the machinist turn up a couple of rolls as described for the ring frame. Remove the weight from the middle leather roll on the fine frame or jack. Just try this on a couple of deliveries, and then size the yarn from these deliveries together with the yarn having been made from all weighted rolls, and all leather rolls on the ring frames. It will be found in every case that the yarn from the frames where the middle weights were removed and from the metal rolls on the ring frames to be much stronger than the yarn made by the Arkwright principle.

There are comparatively few mill men who agree with the writer on drafting, as the majority of them claim it is too wide a departure. However, this method of drafting, or drafting on similar lines, is in practice in both England and France, and has been for a number of years. There are a few mills using metal rolls on this side of the water, but they are not numerous.

One thing I have discovered in the many tests I have made, and that is, a metal roll will never equal the soft cushioned leather front top rolls for the intermediate, fine, jack, ring frame, and mule.

The chief disadvantage of weighted rolls is the dirt and cotton collecting on all top rolls, it takes but a small amount of foreign matter to affect the surface speed of any top leather roll. While on the other hand, the amount of foreign matter that would greatly affect a top leather roll, would not affect metal rolls in the least. Again, the amount of dirt, or neglect of oiling which would greatly affect the surface speed of any top leather roll, would give no trouble whatever to ball bearing rolls.

All that is necessary to clean self weighted rolls is to merely pass a harsh bristle brush over their surface. Roll cleaning as a rule is neglected for the reason that it is too much trouble to clean them.

Another item to consider with this "hang-up" is that very little roll covering is necessary, as you have leather top rolls on only the intermediates, fine, jack and ring frames. Besides, no friction greatly preserves the top leather rolls. In one of my previous articles, I pointed out how the friction of the top leather roll would injure the covering. Examine the flutes on the front roll of any machine that has been in operation for a number of years, and in every case, the side of the flutes last to act upon the

cotton will be found much sharper than the flutes acting first on the stock. The retardation of the front roll wears the flutes to a knife's edge, and at the same time the sharp side of the flutes will make the covering rough, and in a short time. This statement is proven by the fact that when you have a long draft on any machine the roll bill for covering is increased correspondingly. Practical men say that rolls have more to do when the draft is long and the frame highly speeded which is true. However, what is stated in this article can be tried easily, and I am sure that if the reader is a manufacturer and will take the trouble to make the test outlined, he will be well repaid for the trouble, and what is said in this article will receive commendation *after the test.*

COTTON COMBING.

BY F. A. GWALTNEY.

Before cotton can be fed to the combers it must be prepared into a lap. As a general rule, this necessitates the use of two preparatory machines, known as the "Sliver" and "Ribbon" lap machines. Sixteen or twenty card slivers are fed into the sliver machine, the principal part of which consists of three or four drawing rollers, two pairs of calendar rollers and two lap rolls. The slivers are condensed into one solid sheet or lap. Four to six of these laps are placed on two corrugated wooden rollers and fed through four pairs of drawing rolls, which have a tendency to draw the fibers into a more parallel condition. These four or six sheets of cotton are passed over a guide plate through a pair of calendar rolls and condensed into a lap which is in a suitable condition to be presented to the comber. This lap is placed on two fluted wooden rollers at the back of the comber, and is fed to the feed rollers over a guide plate in an intermittent motion at about 3/16 to 5/16 inches per nip. While the feed rollers are passing the cotton forward, the nippers are open, and the detaching rollers, with the segment, are taking the last combed portion of the cotton forward. The nippers then close and hold the cotton in the path of the needles of the half lap, which combs out the short fibers and impurities. While this operation is taking place, the feed rollers and detaching rollers are not revolving. The waste is taken out by the cylinder needles and carried to the back by the cylinder brush, doffer and comb, or by an aspirator. The use of the aspirator is a great improvement over the old system of removing the waste, as the backs of the combs are kept clean by this method, which requires much less stoppage for cleaning the backs, therefore giving a larger production, and enabling the comber tender to look after more machines.

After the nippers open, the segment comes under the combed fibers and carries them forward, with the assistance of the leather detaching roller, which comes in contact with the segment for this purpose, the newly combed fibers being carried forward until they meet the return ends of the last previous combed fibers.

The detaching and attaching mechanism is quite difficult to understand on account of the different operations of the detaching rollers, and more especially the top rollers. They have a rotary motion carried on simultaneously with a bodily motion through space. They have an intermittent and reciprocating motion, besides the rotary motion one way being greater than the opposite motion. In other words, the forward motion, we will say, is twice as great as the backward motion. During the time of combing the roller is lifted out of the way of the needles and lowered again to meet the segment. This is known as the "bodily motion through space." The rotary motion is caused by frictional contact with the long steel roller, and is first made in such a direction as to cause the rollers to turn backward. As soon as the backward motion is completed, the forward motion commences.

The comber requires very delicate adjustment and handling. To obtain the best results, the needles of the half lap should be gone over at least once a week; the top combs should be examined closely each day; the leather detaching rolls should be kept well varnished and the leather kept in good condition. Allow me to say here that it has been my experience that more bad work is caused by poor leather detaching rollers than from any other one source. The rollers are about 10 to 12 inches long and ¾ of an inch in diameter, and it is a very difficult operation to cover them so that they will be of a uniform thickness throughout. These rollers should be ground perfectly true before varnishing. The roller coverer is supposed to do this, but it is well for the mill to have their own grinding machines. If this be well looked after, and all rollers are perfectly parallel, there is no reason why the comber should not give first-class results.

Combers should be stripped of as many of its parts as required to give it a complete overhauling once a year.

Proper heat and humidity plays a big part in obtaining first-class results, but, with the present systems of air conditioning apparatus, we should not have any complaint from this source.

The percentage of waste ought to be taken at least once each week, and if the proper amount is not being taken out, the parts governing this should be looked into.

The reason the comber takes out the short fiber and leaves the long is because the long fibers are taken from the open nippers by the detaching rollers before they are released by the nippers. The short fibers are freed from the nippers before the detaching rollers can reach them; therefore they are carried to the waste tin.

The function of the top comb is to comb out the tail ends of the fibers delivered, and extract the short fibers and impurities. The angle and setting of this comb plays a big part in the amount of waste taken out.

In conclusion, allow me to say that great care should be used in the making of good, even laps, with fibers as parallel as possible. Short piecings up at the back of the ribbon machine will save a lot of broken needles in the cylinder and bad top combs, which is very detrimental to good work, as well as the cost of having them re-needled.

Read before the Southern Textile Association.

Experiments have been made in growing cotton in Southwestern Spain, with promising results—so much so that it is confidently asserted that it will be one of the big agricultural industries of the future. A firm of Texas cotton planters laid down an experimental plantation on the banks of the Guadalquivir River, with selected American seed, as far back as 1905. The crop produced was esteemed excellent and totaled 46,200 pounds of raw cotton, which returned 15,400 pounds of clean cotton, valued at $1,854.

DESIGNS FOR FANCY COTTON FABRICS.

BY THOMAS WOODHOUSE AND JAMES IRELAND.

PART TWELVE.

Fig. 48 is a very simple yet effective pattern, and the principle followed is one which might suggest the making of an extensive variety of patterns. With the exceptions

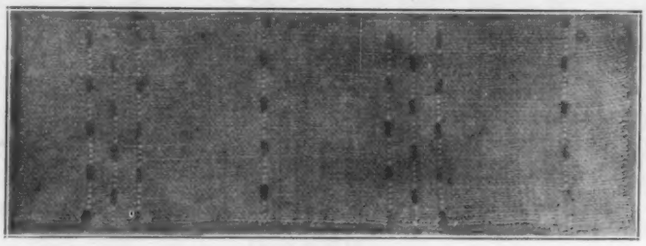


FIG. 48.

of a very few threads, all the threads in this warp weave plain. The stripe effect is obtained jointly by heavy threads and long floats. Thus, these heavy threads interlace as shown by the solid marks in Fig. 49, and, although the four different movements of the harnesses are not identical with those of certain classes of huckaback, they differ only slightly from the latter. As a matter of fact very similar effects could be obtained with the huckaback tappet and proper arrangement of the threads in the harnesses. The draft and weaving plan for the pattern illustrated are shown at S and T. If all the plain threads were controlled by two harnesses worked by a tappet, the figuring threads could be operated by a dobby, and the designer could arrange these threads in any desired manner. Moreover, since there are only a very small number of these heavy threads it might be possible to erect very small banks from the framework of the loom, and to insert small bobbins, each containing one thread. It would then be an easy matter to alter the positions of the threads in the warp as well as to insert different colors, and thus to alter entirely the character of the stripe at will.

A very pretty stripe indeed is that illustrated in Fig. 50, which represents a cloth made with comparatively simple apparatus. The warp and weft are of the same color, in this case a crushed strawberry shade. At U in Fig. 51, all the threads of the fancy stripe are shown along with 8 threads of plain on each side. The complete design, however, consists of 48 threads for the fancy stripe and 46 threads for the plain stripe. From Fig. 50 it is easily seen that the plain stripe is the wider one, but this is because the warp in this section is set on a basis of 60 threads per inch, as compared with a basis of 80 threads per inch in

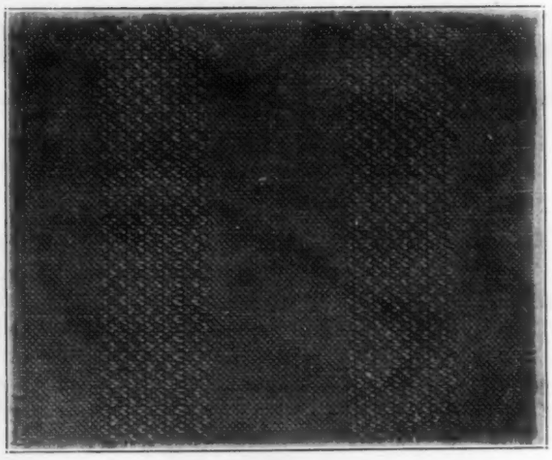


FIG. 50.

the fancy stripe. To compensate for the different sets and to use a reed with the same number of splits or dents throughout, the plain stripe is reeded two threads per split, and the fancy stripe 3, 2, 3 throughout. This order of reeding is represented by the horizontal lines between the design U and the draft V. This irregular reeding, combined with the cutting effects in the fancy weave, is responsible for the characteristic feature of the stripe. It is evident from the weaving plan W that four harnesses only and six picks to the round are necessary; we have shown two repeats in the way of the weft in the design in order

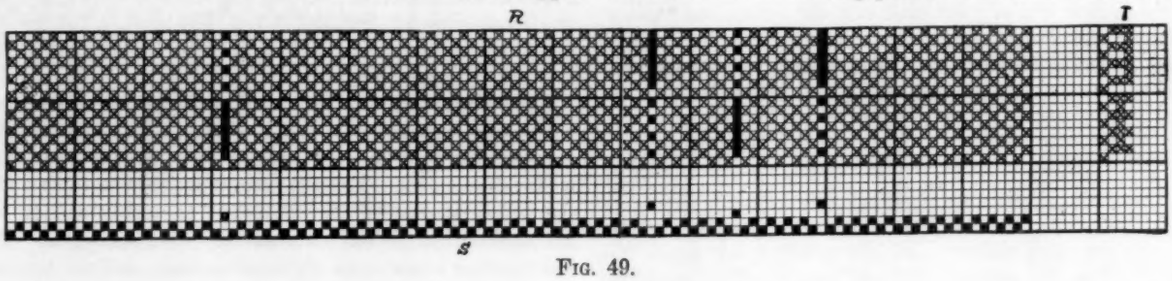


FIG. 49.

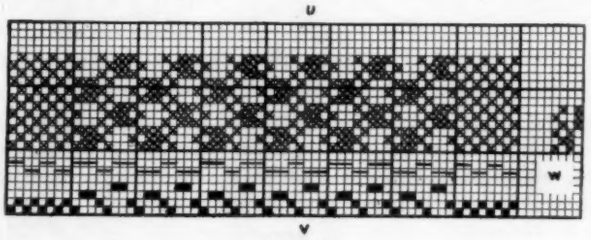


FIG. 51.

better to illustrate the design. The fancy striped part is a further illustration of the turn-over principle as described in connection with Fig. 41. In Fig. 51 the small motive embraces 4 threads and 3 picks, and by turning this over in both ways the unit design on 8 threads and 6 picks is obtained. This unit is then repeated for the necessary number of times for the desired width of the stripe.

(To be continued.)

Don't be afraid to obey. A man must learn to obey before he can hope to command.

KNITTING DEPARTMENT.

DESIGNING ON CIRCULAR FRAMES.

BY WILLIAM DAVIS, M. A.

In the plain frame known by the name of the French or German circular, it was explained that the passing of the needles took place through the agency of a plain disc placed above the needles in such a position that the latter were pressed, as they came around in revolution. Each needle passes under the presser and in turn gets its spring or beard pressed, which operation is a necessity to the ordinary knitting of plain fabric. But the machine under consideration is admirably adapted to the production of fancy designs which are in such demand for manifold branches of the knit goods industry. The presser wheel and its patterning opens up a wide field for pattern origination and one which can be employed even in cases where minute knowledge of knitting mechanism is lacking. In addition to the new pattern produced, the method of knitted fabric structure is one which produces cloth more bulky in handle and more solid in appearance, with the result that its sphere of application is considerably extended.

PATTERN PRESSER WHEELS.

For plain fabric, it has been explained that the surface of the presser is plain and such that all the needles passing under it are pressed in their turn. The pattern presser wheel on the other hand is cut with notches where the pattern has to appear and the wheel is made to revolve on

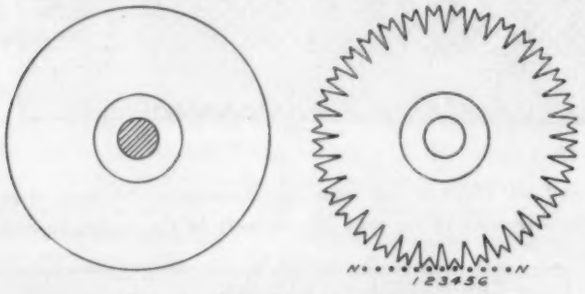


FIG. 1. THE PLAIN PRESSER.
FIG. 2. THE 1 AND 1 TUCK PRESSER.

its own axis by the rotating motion of the needles. The notches cut are of two depths, one quite short, which covers the needle and presses it; the other notch is larger and is such that when it covers the needle the spring or beard is left unpressed and the corresponding stitch is not completed at that point. It is here, precisely, that occurs the chief difficulty for the designer of knit goods. He must see that the stitches which have not been pressed over in one course or feed are pressed over at the next feed. If this condition be not fulfilled, loose, unknitted loops will accumulate on the needle shanks and after a few courses, break the springs of the needles.

In practice it is found that a yarn should not be unpressed for more than three or four courses. A full view of the plain presser wheel is given at Fig. 1 and that of a 1 and 1 cut presser is shown at Fig. 2. In comparison, it will be noted that whilst the edge of the plain presser is quite plain, the edge of the 1 and 1 presser is cut with a small and large notch alternately; every needle space has to be cut on the wheel, so that it may revolve and produce its pattern with accuracy.

The question of the proper discharging of the loops after "tucking" or missing is a very large one. It depends on the nature of the design, the number of "feeds" possessed by the machine, the number of teeth cut in the presser wheel and the total number of needles in the frame. If each feed has a pattern wheel and the number of teeth in the latter divides into the total number of needles in the frame without leaving a remainder, then the same needles would be left unpressed and the same loops would accumulate on the needles.

This problem is rather simplified, if the machine is a two or four-feed, because alternate feeds can be made with plain pressers, so that all the tucked loops are discharged and not more than 2 or 3 threads are allowed to gather. To consider the matter still further, it will be necessary to adopt some means of representing designs on paper. The usual method is to employ the squared variety and to mark it with crosses or solid squares at the points where tucking takes place. Design 1 shows a fabric made with the 1 and 1 tuck presser of Fig. 2, and the plain presser of Fig. 1. The frame employed is of the standard type with two feeds or stitch-forming parts. The lines in the vertical direction represent needles and those in a horizontal direction stand for courses.

The needles N of Fig. 2 are numbered to correspond with the numbers of design 1 where the odd needles are marked with full squares and the even needles are blank on the first course. The odd needles are seen to come under the larger spaces of the wheel cut to correspond to the full squares in the design and so they are not pressed. The even needles come under the small notches and are pressed, and knit their stitches in the ordinary way on the frame. Line 2 in the horizontal direction has no marks, which signifies that all the needles are pressed and therefore form and complete their stitches.

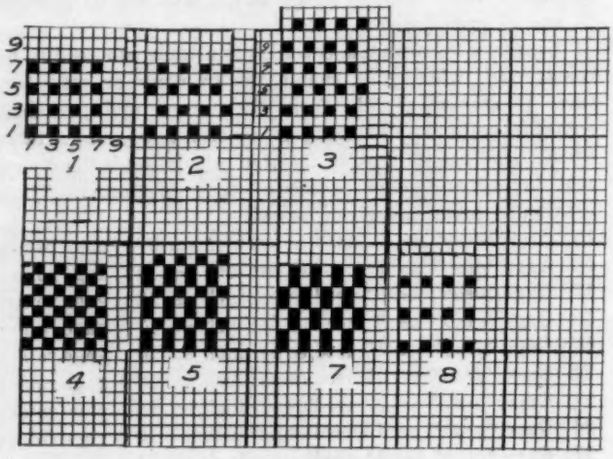
This is caused by the working of the plain presser shown in Fig. 1, which is attached to the second feed of the frame. Patterns made with intervening plain pressers do not have great definiteness, but it is a very popular way of securing the proper discharge of tucked stitches. In design 2 is given another variety made on a 4-feed machine. Course 1 is knitted on the first feed where the odd needles are left unpressed. Course 2 knits all its stitches and is produced by placing a plain presser on the second feed. Course 3 is shown with the even stitches tucked, produced in the third feed by using 1 and 1 cut wheel as in feed 1 but set on to the needles so as to operate the even needles with tuck stitches. Course 4 is plain.

Design 3 is drawn out on similar lines to work on a 6-feed machine, with alternate feeds supplied with plain pressers for courses 2, 4, 6, 8, etc. Courses 1 and 3 are operated by a 1 and 1 presser tucking the odd needles, whilst in course 5 the even needles are tucked.

To consider next the patterns produced without the use of plain pressers and with the 1 and 1 tuck wheel on 2 and more feeds, one example is given in design 4. A 2-feed machine with an even number of frame needles is

employed and the 1 and 1 tuck presser occurs in both feeds, on the odd number courses, the odd needles are tucked, and on the even number courses, the even needles. The same result could be obtained on a 1-feed frame, if the machine contained an odd number of needles. The presser would press the even needles at one course and tuck the odd needles, whilst at the next course, the odd needles would be pressed and the even needles remain unpressed.

Design 5 is suited for working on a 3-feed frame, in each feed a 1 and 1 tuck presser being used. For feeds one and two the pressers are set to press or tuck, the identical needles, namely, 1, 3, 5, etc., are tucked, whilst needles 2, 4, 6, etc., are pressed. The order is reversed at the third feed, where the presser wheel is set to press the odd needles and to leave the even needles unpressed. Design 7 is suited for a 4-feed machine, the first and second feeds tuck the odd needles and leave the even ones untucked.



SOME SIMPLE DESIGNS.

In the third and fourth feeds, the order is reversed and the even needles are tucked, leaving the odd ones untucked. Design 8 is given to show an example of a fabric made on a 3-feed machine where two of them are plain and one tucked, using the 1 and 1 tuck presser on the third feed. The same principle can be extended to machines with a larger number of feeds.

For the practical overseer or designer in charge of this department, it is of the utmost importance that he should be conversant with the possibilities of designing with the simple presser wheel. Frequently much expense is incurred cutting new and more elaborate presser wheels, when quite as satisfactory designs could be obtained by a skilful use of the standard pressers in hand. If there is in the department a suite of frames varying in gage and feed arrangement, the overseer can, with the aid of plain wheels on each, secure results by the methods indicated. The color arrangements also admit of considerable variation. The foregoing designs worked in one color can be made to look entirely different when two or more colors are employed. Each feed can have a different color if desired. On a 2-feed machine, 2 colors can be used; on a 3-feed, 3 colors; on a 4-feed, 4 colors, and so on.

THE GAGING OF MACHINES.

In circular knitting machines, there can be no doubt that the ideal mode of numbering or gaging would be to count by the needles per inch, measured at the outer edge of the circle of needles, where the formation of the loops actually takes place. It is a matter of surprise that this method has not been adopted. In the case of the frame under consideration, we find that the gage scheme belongs to the old school of arbitrary methods. A table is drawn out and the gage number given, but there is no definite relation of one gage to another. When a gage is given, the only way is to refer to a table of equivalents in needles per inch, when an accurate idea of the fineness can be arrived at. It is, of course, at the discretion of the user of the machine to discard the original method of gaging, obtained from the counting of origin and to translate the gage either into needles per inch or into the well known system of gaging rotary frames of the Cotton's Patent type. All manufacturers are aware of the confusion arising from the adoption of several methods of gaging in a factory, and it is customary to have one system of needles per inch for latch needle machines and another system of the number of 2 needle leads on 3 inches for spring needle frames.

The original frame gages for French or German circular machine is given herewith and it will be noted that the table falls under two divisions, *"grob"* the German word for coarse and *"fein,"* the German term for fine gage.

10	Gage *"grob"* frame has	6	needles per inch
12	Gage *"grob"* frame has	7	needles per inch
14	Gage *"grob"* frame has	8	needles per inch
16	Gage *"grob"* frame has	9	needles per inch
18	Gage *"grob"* frame ahs	10	needles per inch
20	Gage *"grob"* frame has	11	needles per inch
22	Gage *"grob"* frame has	12	needles per inch
24	Gage *"grob"* frame has	13	needles per inch
27	Gage *"grob"* frame has	14	needles per inch

20	Gage *"fein"* frame has	15	needles per inch
22	Gage *"fein"* frame has	17	needles per inch
24	Gage *"fein"* frame has	19	needles per inch
25	Gage *"fein"* frame has	19½	needles per inch
26	Gage *"fein"* frame has	20	needles per inch
28	Gage *"fein"* frame has	22	needles per inch
30	Gage *"fein"* frame has	23	needles per inch
32	Gage *"fein"* frame has	24	needles per inch
34	Gage *"fein"* frame has	25	needles per inch

A glance at this table shows its unreliability as a means of camparison of one gage with another. In the first place confusion arises from the two divisions of coarse and fine. If the coarse gage numbers took in only the coarser gages and ceased when some number such as 20 were reached things would be simplified, but it will be seen that the *"grob"* numbers continue up to 27 gage and the *"fein"* numbers beginning at 20 go up so as to include the finest machines, consequently between the numbers 20 and 27 there is an overlapping which makes it necessary to append the word *"grob"* or *"fein"* after each gage number.

A modern table of gages ought to have a rational basis and given the equivalent needles per inch for one unmber in the series, one ought to be able to infer the needles per inch for any other gage. This point will be better understood by a reference to the table. A 10 gage machine is stated to have 6 needles per inch and a 20 gage of the same *"grob"* table has 11 needles per inch. In any rational system the 20 gage would have exactly double the number of needles per inch to a 10 gage, namely, 12. The 20 gage *"fein"* machine has 15 needles per inch, whereas, the 30 gage of the same table has 23, 22½ needles per inch

being obtained by the direct method of calculating from the 20 gage. The 12 gage *"grob"* machine has 7 needles per inch, whilst the 24 gage of the same series contains only 13 needles per inch.

In some cases the discrepancy is small but it is always sufficient to create a feeling of unreliability when comparing one gage with another. For firms who make a custom of recognizing only one system of gaging for all spring needle machines, it will be useful to transfer the numbers given in the table to the corresponding gages of Cotton's Patent rotary spring needle machines. In Cotton's Patent frames, the needles are cast in leads, for the general run of gages, 2 needles being present in each lead. The gage number then is given by the number of such leads on 3 inches, a 12-gage machine having $12 \times 2 = 24$ needles on 3 inches, or 8 needles per inch.

From this it is easy to calculate the gage, given the needles per inch of the frame. The 22 gage *"grob"* in the table shows 12 needles per inch which gives $12 \times 13 = 36$ needles on 3 inches $= 18$ leads of 2 needles each on 3 inches, or 18 gage.

To construct a simple formula which can be applied in all cases, let N be the needles per inch and G the Cotton's Patent rotary frame gage number, then

$$G = 3/2\ N$$
$$G = 1.5\ N$$
$$\frac{G}{1.5} = N$$

Applying this in the last example, namely, 22 gage *"grob"*, with 12 needles per inch, the Cotton's gage would be given by

$$\frac{G}{1.5} = N = 12$$
$$\frac{G}{1.5} = 12$$
$$G = 12 \times 1.5$$
$$G = 18$$

That is, the equivalent of a 22 gage German *"grob"* is 18 gage "Cotton's" method. As another example, calculate "Cotton's" frame gage, which is equivalent to 20 gage *"fein"* German circular frame.

From the table, 20 gage *"fein"* has 15 needles per inch and from the formula we have:

$G = 1.5\ N = 1.5 \times 15 = 22\frac{1}{2}$ gage Cotton's.

The problem can be reversed and, given the rotary gage of a machine, we find the needles present per inch and hence by reference obtain the equivalent German machine gage. Example: Find the German gage which will be equivalent to a 20 gage rotary frame.

$$G = 1.5\ N$$
$$20 = 1.5\ N$$
$$\frac{20}{1.5} = N$$

$13.3 = N =$ needles per inch. In reference to the table we find that the nearest German gage is 24 gage *"grob."*

Another example: Calculate the German gage which will be equivalent to a 28 gage rotary.

$G = 1.5\ N.\quad 28 = 1.5\ U.\quad 28/1.5 = N.$

$18.6 = N =$ needles per inch. On reference to the table it is found that the nearest German equivalent is 24 gage *"fein."*

Frequently it is necessary to find the gage from the woven fabric and the first step is to measure the stitches per inch in the width. Some allowance has to be made for the shrinkage which the fabric undergoes when it leaves the needles of the machine; for cotton yarns this shrinkage is usually less than for woolens, and for silk it is less than either. The contraction varies between 5 per cent and 20 per cent, according to the elastic nature of the material and the tension at which it has been worked.

Example: Find the German gage for a fabric made from cotton yarn, where the stitches in the finished cloth number 15 per inch. Allow 10 per cent for contraction.

The number of stitches per inch require to be reduced by 10 per cent, thus: 100 : 90 : : 15 : or

$$\frac{90 \times 15}{100} = \frac{27}{2} = 13\frac{1}{2}$$ stitches per inch on the frame.

Referring to the table we find that the gage will lie between 24 and 27 gage *"grob."*

By using the formula $G = 1.5\ N$ a table can readily be constructed, which will enable the overseer or manufacturer to convert readily from the normal and prevalent rotary gage to the German gage or *vice versa*, and a table of this kind has its uses, in that the calculation is done once and for all and much saving of time is effected. These conversion tables are given herewith:

10	Gage *"grob"*	= 6	needles per inch	= 9	gage rotary
12	Gage *"grob"*	= 7	needles per inch	= $10\frac{1}{2}$	gage rotary
14	Gage *"grob"*	= 8	needles per inch	= 12	gage rotary
16	Gage *"grob"*	= 9	needles per inch	= $13\frac{1}{2}$	gage rotary
18	Gage *"grob"*	= 10	needles per inch	= 15	gage rotary
20	Gage *"grob"*	= 11	needles per inch	= $16\frac{1}{2}$	gage rotary
22	Gage *"grob"*	= 12	needles per inch	= 18	gage rotary
24	Gage *"grob"*	= 13	needles per inch	= $19\frac{1}{2}$	gage rotary
27	Gage *"grob"*	= 14	needles per inch	= 21	gage rotary

20	Gage *"fein"*	= 15	needles per inch	= $22\frac{1}{2}$	gage rotary
22	Gage *"fein"*	= 17	needles per inch	= $25\frac{1}{2}$	gage rotary
24	Gage *"fein"*	= 19	needles per inch	= $28\frac{1}{2}$	gage rotary
25	Gage *"fein"*	= $19\frac{1}{2}$	needles per inch	= $29\frac{1}{4}$	gage rotary
26	Gage *"fein"*	= 20	needles per inch	= 30	gage rotary
28	Gage *"fein"*	= 22	needles per inch	= 33	gage rotary
30	Gage *"fein"*	= 23	needles per inch	= $34\frac{1}{2}$	gage rotary
32	Gage *"fein"*	= 24	needles per inch	= 36	gage rotary
34	Gage *"fein"*	= 25	needles per inch	= $37\frac{1}{2}$	gage rotary

(To be continued.)

The removal of oil stains contracted during manufacture is a matter of inconvenience if not of difficulty. Different parties use different methods, and it is perhaps true that few of these really realize the objective. It may, therefore, be of interest to mention a method which is regarded as answering the purpose better than any other tried. If the stains are observed before the dyeing operation, the affected parts should be impregnated with olive oil and the dyeing proceeded with at once; or, in some circumstances, it may suffice merely to add about 4 per cent of castor oil to the dyeing liquor. When observed only after the dyeing, or if the preliminary treatment has not been successful, it is advisable to sort out the stained articles, impregnate them with oil, and dry. Afterwards rub the places with a stiff brush smeared with castor oil. Then wash well in a solution of soap, and the result will be that the stains have disappeared.—*Textile Colorist.*

Dyeing, Bleaching and Finishing.

SYSTEMATIC SUPERVISION IN DYEING AND BLEACHING.

BY ANDREW FISHER, JR.

George William Curtis once said: "Progress is everywhere the golden fleece to be won only by hard contention, by taming fire-breathing bulls of stupidity, by slaying dragons of malignity, and by victoriously withstanding hosts of slanderers and liars sprung from the teeth of venomous serpents." Most of us know that there are plenty of bulls of stupidity in the world, and that progress is confronted with obstacles hard to overcome. The men who control the financial end of the textile business are often ignorant of the details, and the practical men have to tame bulls and slay dragons in order to accomplish results.

The object of this paper is to discuss briefly systematic supervision in the dyehouse, which will make it possible to keep up to date in regard to materials used. It is not always the lowering of costs and increase of production which is aimed at, but also the improvement of the product with regard to general appearance of the goods and fastness of the colors used. A man may weave and spin well, but poor colors and bad finishing keep his goods in the storehouse. Charles M. Schwab recently said: "Great corporations have done great harm in deadening individual initiative," and further: "Determine what is a fair output for a fair wage in any department, and then, when that output is exceeded in quality or efficiency, share with the actual producers in this department the profits of their produc-

No department in the mill needs intelligent supervision more than the dyehouse, yet few mill men ever keep accurate records of the costs of dyeing the various shades produced. Usually dyers have an approximate idea of the costs of different shades, but they are not carefully kept and recorded.

Systematic supervision must result in progress, individual initiative being preserved by encouragement from the executive head. We cannot have progress without initiative; therefore let us have intelligent supervision in order that individual initiative may meet with its just reward. If this paper, by mentioning a few incidents of dyehouse and bleachery routine, causes you to think a little, some good will result.

Progress in the dyestuff industry has been rapid, the Germans now having the supremacy in the dyestuff and chemical business. The quality and strength of most dyestuffs have been wonderfully improved during the past twenty years, and as a result many fast colors are now in use, much to the disgust of paper makers and other users of rags and mill waste.

The use of dyestuffs and chemicals has followed along lines laid down by the manufacturers, and the user and the maker cooperate somewhat, although it may be safely said that the user is more conservative. In a recent conversation with a gentleman of the old school, this remark was made: "No, we do not require fast colors in our mill." Doesn't it seem as if the user should demand fast colors rather than object to them?

Industrial research along these lines should be carried on to a much greater extent by the cotton manufacturers, who should constantly strive to improve the quality of their product. A man recently took charge of the dyeing department of a large concern. The results obtained in the department previous to his arrival had been poor. This man introduced a system of trial and thorough test of every dyestuff submitted. His method of keeping records was as follows: He used an ordinary filing cabinet, provided with indexed folders, similar to those used in filing correspondence. On each folder was placed the name of each dyestuff submitted for trial, the date, price quoted, maker's name and address, as well as the formula used, and a sample of the dyed result. The tests of value to him are: 1. Fastness to light. 2. Fastness to washing. 3. Fastness to bleaching.

These tests are made on the dyed sample and neatly mounted on the folder. As a result, he always selects suitable colors for his work, taking no chance of putting out goods unable to stand all sensible requirements.

Under the system previously used it was impossible to know definitely the dyestuffs used to produce each shade, the cost, or the trials made to produce the same shade with other colors. Consequently the salesmen calling at the mill were unable to know if the goods they carried would be of value to the concern, and never felt certain that the samples submitted were given a fair trial. Whenever a new shade was wanted or any dyehouse problem arose, very little reliable data was available. The new man has every shade matched up with all the latest as well as cheapest and fastest colors, and keeps his laboratory staff everlastingly at it, and has little trouble in getting any desired shade at short notice. For example, take a fairly heavy green shade. This is rather expensive, and it will be well worth while to be careful to use the dyestuffs, which may be obtained at the lowest price, without sacrificing anything in the way of quality.

The dyestuff concerns are glad to match any shade submitted. From them we get every possible method known to them. We take all the colors submitted by them, find the least expensive method of obtaining the desired result, by any combination we can make from these, or other colors, keep an accurate record of all trials made, the cost, level dyeing properties, and fastness tests. When we get through we have something which will serve the purpose better than the old method and usually at a much lower cost. Every mill dyeing regular shades should have some competent person take them one at a time to see what improvements can be made. If a big saving or an improvement in general appearance or fastness is possible, the change should be made just as soon as an opportunity presents itself, but it is not advisable to mix things up by constant changing, as slightly different results cause trouble. If an arm of a shirt is the least bit different from the body (even after it has been worn for some time) it may injure the reputation

Presented before the National Association of Cotton Manufacturers.

of the mill. Many of the mills making blue check apron ginghams have of late years dyed the warp in long chains in indigo vats and have dyed the filling with sulphur colors in the raw stock, spinning directly on to the filling bobbin, thus saving the cost of quilling. The indigo fades much faster than most sulphur blues and the result is that after the apron has been laundered a few times the warp and filling no longer match. This makes a bad looking piece of goods and both warp and filling should be of similar fastness properties.

Very often laboratory tests of colors are not carried out on a sufficiently large scale to be of much importance to the dyehouse. It is advisable to always conduct tests on a large enough sample so that the results will be close to those to be obtained under practical conditions, and in all cases costs must be determined from the actual work, not from samples. The cost of drugs used in the dyehouse over a period of six months must exactly balance the sum of the costs which is charged against each shade produced, and on account of all re-dyes must be carefully kept. In this way the efficiency of the department will constantly improve.

As a general proposition, the labor and dyestuffs used per pound of goods dyed may be reduced by making the batch as large as possible. A man can handle the work better and the shade will run more uniform. This is especially true in long chain dyeing of warp yarn where all the chains making up the set are dyed in one bath.

For piece goods dyeing, the keeping of accurate records is extremely important, as the shade is usually matched by making one or more additions of fresh color. In some dyehouses, the dyer is paid a bonus for matching his shade in two trials. The fewer additions necessary and the less time required, the greater the chance for uniformity, and a bonus of this kind, if sensibly carried out, is found to be profitable to both the manufacturer and the workman. By constant examination of shipments of dyestuffs received and close inspection of the results obtained in the mill, the laboratory may become a great aid to keeping results uniform and helping the dyers earn their bonuses.

If the exact cost of dyestuffs, chemicals and labor for dyeing each shade is recorded, the executive of the concern may find it possible to avoid expensive dyestuffs and expensive shades. If orders can be obtained on styles using shades of low, rather than high cost, profits are materially increased. If dyestuffs and labor are constantly being reduced, the men in the dyehouse may well be given a share of the increased profits which they have helped to earn.

Systematic research work in connection with bleaching and dyeing must become more general. Years ago when chemicals were very expensive, much greater care was taken to obtain economical results.

There is a book, written by Bertholett in 1804, entitled The Elements of Dyeing and Bleaching, and it is unfortunate that there are not more men like him today. He was a practical man, as well as a great student and scientist. He controlled his bleaching process chemically, that is, he measured the excess chlorine used in bleaching and kept his results very uniform, for he found that the goods were not well bleached until the bath ceased losing in chlorine content.

The theory of bleaching with chlorine compounds is that the chlorine set free forms hydrochloric acid (H Cl) and sets free oxygen (O) from the water present. Of course a slight amount of moisture is the same thing as a lot of water and it would be interesting to see what rapid results might be obtained if we had gas bleaching for raw stock, similar to the dry carbonizing process used in woolen mills.

Bertholett made his own chlorine and the workmen were nearly suffocated at times because the gas escaped from the bleaching bath and filled the room. Javelle overcame this by using a solution of caustic soda to hold the gas (now known as Javelle water) and found he could get much more gas into the bath in this way. Tennant afterwards found that lime water would take up more chlorine than Javelle water. The bleaching powder of the present day is made by passing chlorine gas over lime and good bleaching powder contains about 35 per cent of available chlorine.

The writer once made several experiments to determine the most efficient method for bleaching raw cotton and found that when water and chlorine gas are used without any alkali being present, less chlorine is required. The operation was carried on in a pressure machine, that is, the cotton was packed into the machine and the cover screwed down tightly, the bleach liquor then forced in from beneath and out through the holes in the cover. It was then circulated for about fifteen minutes to make sure of uniform results. The working pressure for the operation was about fifteen pounds per square inch. The bleaching powder solution was found to be cheapest and the results were about the same as far as uniformity was concerned. Bleaching powder is at present much the most economical method of obtaining chlorine for bleaching cotton.

The results of my trials led us to make certain changes which made the bleach house turn out more uniform results at less cost, and convinced me that the whole dyehouse problem is to be handled best by exercising intelligent and systematic supervision over the workmen. If we keep everlastingly at it we will find the most economical method for producing each desired result and if the executive power happens to be placed in the hands of men capable of comprehending the chemistry and mechanics involved in these operations, the efficiency and economy of the dyehouse should be excellent.

American cotton goods are recognized by the Chinese as superior to those made in Japan, the sales of which have so greatly increased in the last few years in the Manchurian market. The superiority of Amercian goods lies in the fact that not only are they of finer and more substantial texture, but they are also less heavily sized than the Japanese, which, when washed, lose a greater percentage of their weight than do the American. Japanese goods have supplanted those of American manufacture for a number of reasons contributing mainly to cheapness, of which may be mentioned: (1) The smaller cost of transportation from the mills, and incidentally the advantage of direct and frequent shipments; (2) the presence on the ground of Japanese firms with extensive facilities for the distribution of goods, enabling the Chinese dealers to obtain supplies in quantities as small as they desire, while in buying American goods through Shanghai importers it is necessary to contract for considerable quantities at a time—more than most native dealers are able to handle; (3) the difference in time required for filling a contract, this being two or three weeks in the case of Japanese, against two or three months required for American.

Don't be afraid to hustle; be glad of the chance.

Practical Problems Discussed by Cotton's Readers

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so indorsed. This department is open to all. Suitable letters are paid for in cash.

THE REWORKING OF WASTE.

EDITOR COTTON:

In the April issue of COTTON I see "Toothless Tom" would like to know which produces more waste, a fine or coarse mill? I found his letter very interesting, and it is such letters that set men in the cotton industry thinking, as waste is a very expensive item. However, he failed to point out the evils of running waste over again. I believe in the laws of compensation, you pay for what you do. You will not find coarse mills running over the waste made among the mills paying the highest dividends.

A book or two could be written on this subject, but I am going to point out my views in a brief way to show how mills running waste receive no benefit.

(1) When you run the waste over again, you are obliged to insert a little twist, which means a loss of production, and if a loss of production will not reduce dividends quicker than anything else, what will?

(2) Every experienced mill man will admit that a part of the short stock will leave the strand of cotton in process.

(3) When the short stock leaves the strand or thread, it collects in clusters on the roller beams and other parts of the machinery, and by draught or other means is often taken up by the thread in bunches, which makes many yards of cloth seconds.

(4) When waste is run in mills where there are mules, a certain number of weights must be taken from the fallers which results in a soft cop.

(5) When you weaken the strand by running waste the unequal condition found on all fly frames overcomes the strength of the strand, and many ends are broken during the building of a set.

(6) Weak yarn means poor spooling, warping, slashing and weaving.

(7) Waste will make the bobbins uneven in diameter as they fill on the fly frames, which causes the ends to snap every little while.

Even if a little twist is inserted the roving will break back in the summer months.

I could go on and point out a great many more evils that waste causes, but instead I am going to give a little mill experience which I know will hit the readers of this department as true.

I was once placed in charge of a mill where the ring spinning had been running badly for almost a year. The mill was the talk of the neighborhood. I was not in charge but a little time when I was informed that the spinning started to run badly as soon as a new waste machine was installed in the picker room to run all the lap waste made in the mill. I immediately ordered this machine stopped, and the result I obtained has convinced me beyond a doubt that running waste over again is more of a loss than a gain.

Wash. (Mass.)

Reducing the Amount of Cut Waste.

EDITOR COTTON:

One of the principal sources of waste and one that is often overlooked in the cotton mill, is the amount of cut waste. This is something that should be kept down as low as possible, from the flyframe to the reeling or warping machines. Some operatives take a bobbin from the creel at the back of the flyframe and cut it, although this bobbin may have at least two layers of roving on it. This may seem little to a person running flyframes, spinning, twisting, spooling, winding or reeling machines, but say, for instance, that we were to let this bobbin run until it had about ½ layer of roving on it before we took it out, we would be surprised at the end of the week to find the small amount of cut waste, and also the increase in the production of the machines, particularly the flyframes, as the writer is only dealing with them at present.

If we are to let the speeder-tender cut every bobbin that he or she takes out of the creel with two layers of roving on it, we are simply slicing about 1/10 per cent of the finished product into cut waste. I am bringing this to light for the simple reason that it will help the readers of COTTON a great deal I am sure, after seeing that the speeder-tenders run their bobbins down to at least ½ of a layer before they take them out to put in full ones, we may be sure that at the end of the week there will be an increase in the production, because, if that layer and a half is run right through the rolls and onto the bobbins that are on the spindles instead of being cut, it will fatten the production, at the same time keeping the amount of cut waste very low.

The writer, while going through a card-room one morning, happened by chance to look between the creels of a flyframe, and to his surprise, saw on the floor a girl cutting the layers of roving on the bobbins, and there was also a good sized basket in front of this certain girl, full of these bobbins to be cut. Was that increasing the production or increasing the amount of waste, and yet, I was told a few days before, that the overseer in charge was always in hot water with the superintendent, the latter claiming the production was very low in this certain card-room.

This overseer knew that his speeder-tenders were cutting a lot of roving, which should have made a great many yards of yarn, had it been run down to at least ½ of a layer before being taken out to be replaced by full ones. But still he preferred being roasted by the superintendent to enforcing a few rules upon his help, and even to this day they are still cutting up a great deal of what could have been finished product.

I am bringing these points to light for the purpose of informing young overseers. The card-room is one of the most important departments of a cotton mill, and any overseer who lets his help cut the roving that is on the bobbin is just simply cutting up into waste the profits of a mill.

Coming to the spinning room, we find them, also, cutting a lot of roving from the bobbins that come from the card-room. This is when they have the roving coming out all at once, or together, then it is necessary to cut some bobbins that have a little more roving on than usual, but not in all cases, as some spinners cut a lot of roving when they are putting in the full bobbins, for the simple reason that they prefer putting in the whole side at once instead of running back and forth every few minutes to put in roving where there are a few bobbins running out. This is a bad practice, as far as keeping the amount of cut waste down is concerned, and also because the next time this certain frame has the roving bobbins run down small, they will come out together, thus causing some more cut waste. Therefore, the writer thinks it a good idea, and also a good practice, to let the roving get down as small as it can possibly go before replacing, or in other words, let the bobbins get so low that there will only be about ½ a layer of roving on them, just as in the case of the flyframes.

Cut waste, however, does not always come from the roving bobbins, but after it has been run through the frame, and after having all that trouble of making into yarn, and the labor cost entailed, then at the end of the set, or at the end of the day, this certain yarn is sent back to be cut up into waste, for the reason that it is either too soft or else the rail got stuck in some place, which caused a bad set. This is not the fault of the help, even if a frame makes a bad set, although they are warned if a frame is not running in perfect condition to stop it, and notify either the section hand or the second hand, but it is the fault of the section hand or his superiors if the frames have not enough pick, or in other words, if the yarn on the bobbin does not slope down from the top. In some cases where there is little pick given the frame, when the bobbins reach the spooling machines they run off the top, thus causing the spooler-tender to cut them, which means that by the end of the week the increase of cut waste is high and the production low.

This will serve also as a pointer to carders who allow the roving to be creeled altogether, and furthermore, the only remedy that the writer has seen to work well on those bobbins that come from the spinning frame with little pick, is to take a basin of water and dip the top of every bobbin before passing them to the spooler, this saves a great deal of yarn, which would have to be cut, if it went directly from the spinning frames to the spooling machines, without being dipped in water, this remedy holds good only when the bobbins come from a frame with very little pick.

Lewis. (Mass.)

MANAGEMENT.

EDITOR COTTON:

In a recent issue "A. J. T." requested some old overseers to write on the managing of help. I would say for the benefit of "A. J. T." and others who are interested in this subject that you cannot manage help all the same way. The nature of people is different in different places, so you will have to adapt yourself to circumstances and use a little common sense. An overseer or second hand should be a man of good appearance and should understand human nature.

There are men who, when they receive a small promotion, allow their heads to swell so they would not recognize their own mother. If a hand should come and ask them a civil question, they would answer in a rough manner. For instance, if one asks permission to get off for a day or so, the overseer would want to know where, why and all about their personal business, which is no concern of his. It is his business to know whether he can let him off or not and to say so. This is not good management.

Always treat the help with the greatest respect, in the mill and out; always recognize them whenever you meet them. Have the help respect you and do their work without fear. Have your room systematized. Do not have any favorites, but treat all alike. Do not try and do all the work yourself. An overseer's eyes are worth more than his hands. Have your room clean, especially the toilets. Do not allow waste to be thrown on the floor. Have a place for everything and everything in its place. If you have any spare help in the room, do not let them help one more than another. If you do, it causes dissatisfaction. Do not curse in the presence of the help, if you are infected with this simple habit.

I find that the best way to manage help is to systematize the room; get the work to run smoothly; use a little common sense and go ahead. Most of the trouble in any room comes from bad management and work. It is a well-known fact that there are men who have charge of help who are not fit to manage cattle, and do not use any more judgment than a beast. Be a gentleman at all times and you will not have any trouble. Remember that you have once been right where they are now. Remember that you may have mothers, fathers, sisters or brothers working for someone's support. Treat your help as you would like to have your own people treated. It is a hard problem to tell any overseer how to manage his room. As Arthur Pryor, the great trombonist, once said, "I can tune the instrument, but not the man." The only thing I can say is to use common sense, adapt yourself to circumstances, then go ahead, and an all-round satisfied feeling will be felt and seen and enjoyed throughout the business.

X. Y. Z. A. (Mich.)

A QUESTION OF LOSS PERCENTAGE.

EDITOR COTTON:

I see that "H. O. W." takes exception to my statement in the December issue, relating to slow and quick carding. He says if he feeds a lap at 25 yards per hour and he increased it to 30 yards per hour, he would be, beyond doubt, carding quick. Of course, I have heard the expression "quick and slow carding" hundreds of times, but I took it for granted that "Student, Ala." was only learning and to a beginner the terms light and heavy and slow and quick carding are confused, so I made the statement that there was no such thing as quick and slow carding, to convey the thought to him that if you increased your production by changing the barrow it would not affect any part of the card that does the carding, so would it not be better to quit using the terms "quick and slow carding" and simply say we increased or decreased our production, according to the condition of the room or the quality of the stock we are using?

I thought at the time I made the statement that it would be criticised and I thank "H. O. W." for taking me up on that point. It is just about the same argument that appeared in these columns some time ago as to which term was right in cotton spinning calculations: factor multiple

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COTTON MACHINERY

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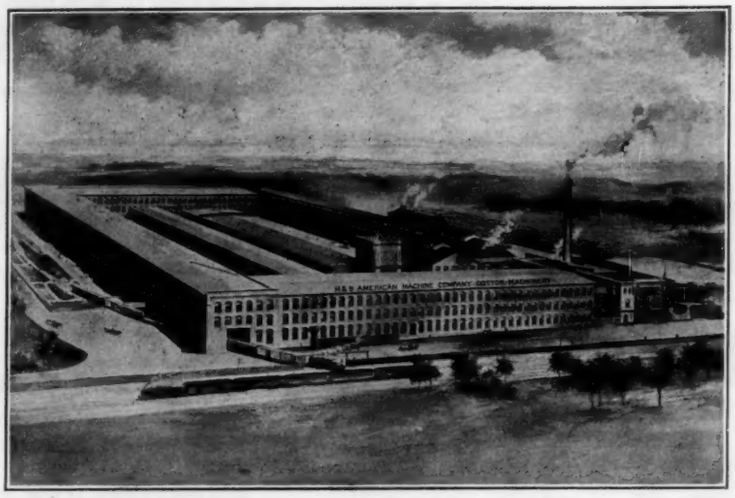

Spinning Room Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

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PAWTUCKET, R. I.

or constant. If we could drop some of them I am sure it would be easier for a beginner to comprehend the meaning of the ones adopted. I think "H. O. W." will find that the faster the doffer goes, the worse looking the web will be. If I could keep up with the drawings by using a 22 barrow gear, I would not use a 24 gear and expect better results, because if I strip often enough so I don't allow the cylinder and doffer to get filled up, the doffer, as a rule, will take care of the fibers as they are brought within reach of it.

"H. O. W." says further, "and it is the cylinder that does the carding." Now, I am sure that the flats do more carding than the cylinder, which can be proved by weighing the flat strips taken from a card after running two or three hours, and weighing the cylinder strips after the same period has elapsed.

I would like to hear from some reader regarding the following question, which I have not heard brought up before. It is the custom at some mills to get an idea of the loss percentage in the samples of cotton sent to them by running them through a card. Now suppose one sample shows 8 per cent loss, and a second sample figures out 10 per cent loss; is there only 2 per cent difference in the two samples? Would not there be a greater proportion of dirt going in with the sliver in the running of the second sample? To make it plainer, if you had a sample entirely free from impurities, which of course would show no loss, and then run one figuring 8 per cent loss, one sliver would be perfect but the other would have some dirt in it plus the 8 per cent, so I think it should be taken into consideration when sampling cotton. Remember, we are all students and I would like someone to give an opinion on this.

"Lance." (Michigan.)

AN EXPERIENCE WITH "SNUBBY" FILLING.

EDITOR COTTON:

Several years ago I was overseer in a mill running a large part of their product for the oil cloth contractors. These goods were to be converted by enameling into window shades and table oil cloth. The novice can readily see these goods required a smooth face devoid of strings, gouts, snubs, etc. At best it was quite a problem to get out and keep out these defects. At one time we had quite a protracted siege with what we called rope filling, that is sometimes, at the change of the filling, there would rope off great bunches of yarn varying from a couple of threads to a rope sometimes nearly as large as one's finger. This of course gave the cloth room no end of trouble and so serious did this grow that for quite a spell we had to work a night and day force of inspectors, burling and cleaning these goods so as to get any appreciable part of them in a marketable condition.

The worst of the matter was, no one seemed able to locate the trouble. The spinner lengthened his traverse until the quills were so sharp and long as to contain only a very small portion of yarn. The weaver tried various adjustments of power on picker sticks and still the trouble seemed to grow rather than decrease.

When finally located it was found that the very thing nearly any spinner or superintendent would do, i. e., lengthen the traverse, had been in this instance the cause of all the trouble. When found the cause proved to be the small dagger or finger of the automatic weft replenishing attachments on the loom. The traverse, when lengthened, run the yarn so far up on point or end of quill before re-

versing that nearly or quite all the quill was covered, and when this dagger or finger came down with its lightning-like stroke to place a new bobbin in the rapidly moving shuttle, instead of striking the wooden end of quill it would strike back on the yarn and loosen it on the quill, later to run off into a rope or snub, and when the trouble was located and adjusted, we returned to normal conditions again.

As I have seen this same trouble in a less pronounced form in some other mills and I am almost certain from the same cause, and as such defects are objectionable in any goods and very serious in some, I write this little experience hoping it may come to the eye of some one similarly troubled and be some help.

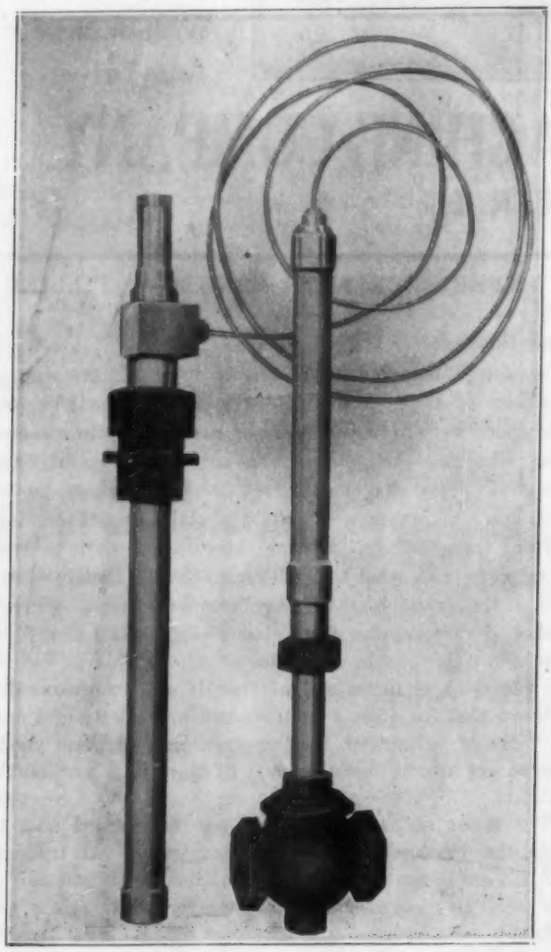
Cloth Room. (Mississippi.)

The area under cotton in the French island of New Caledonia, in the Pacific Ocean, is steadily being extended. Exports in bales of 500 pounds each were 2 in 1908, 48 in 1910, 180 in 1911, and 800 bales in 1912.

New Machinery and Trade Notes.

A TANK TEMPERATURE REGULATOR.

The accompanying cut shows the Sarco temperature regulator, which is manufactured by the SARCO ENGINEERING CO., 116 Broad street, New York City. This regulator is based on the same thermostatic principle as the well-known Sarco steam trap, using as its actuating motive power



the expansion of a sensitive liquid hermetically sealed within a chamber, into which is inserted a flexible corrugated tube. This regulator is substantially made and not liable to get out of order; is compact, simple and wholly self-regulating, requiring no exterior operating means, such as compressed air, water or electricity. It also avoids the use of rubber or leather diaphragms, which are of a perishable nature, and of metal disk diaphragms, which change their form with considerable resultant inaccuracy. The apparatus is easily installed and may be arranged to regulate the temperature of water or any other liquid, being provided with an adjustable regulating device by which any desired temperature within a given range may be maintained constantly. An illustrated circular describing and fully illustrating this useful instrument may be secured on application to the manufacturers.

SCIENTIFIC RAT KILLING.

In 1900 Dr. Danysz, in his capacity as director of the laboratory of agricultural micro-biology of the Pasteur Institute, Paris, had his attention directed to an outbreak of a disease amongst field mice. He investigated the epidemic, and after prolonged search succeeded in isolating the germs of the disease. The history of his work to produce a virulent culture that could be used in the war against the rodents would fill volumes. Finally, after much research and experiment, Dr. Danysz obtained a very virulent culture that preserved its virulence for several months.

The problem of preparing the virus so that it would be within the reach of everybody next had attention. Dr. Danysz found that the germs would live on a form of specially prepared gelatine and could be kept alive and virulent in test tubes such as scientists use if a certain amount of air space was left in the tube; next, the question of preparing the tubes for transportation was considered. A uniform temperature was desired, and tubes must not be exposed to the light. The tubes were sealed and wrapped in paper, packed in cardboard boxes with asbestos in lots of one, three, six and twelve tubes, and these boxes packed with asbestos in cases containing 250 tubes each. In this way Danysz virus is now transported to all corners of the earth and the germs kept alive and virulent from two to three months.

Remarkable success has been had in Russia, England, France, Germany and Holland. In France and Holland, Danysz virus is distributed by the government. The Danysz Virus, Ltd., was formed in London, and the distribution of the Danysz virus was carried on in England and Germany as well as other countries of the world outside of France and Holland. In England whole villages and towns have waged a war on rats and mice by this method. One thousand tubes of virus were used on the London subways with remarkable success. A few days after the application rats began to rush to the surface. Each morning, when the sta-

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They know that a Barrett Specification Roof is a substantial, fire-resistant roof, accepted at base rates by insurance underwriters.

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A copy of The Barrett Specification will be sent, on request, to any architect, engineer or property owner. It formulates a precise and practical way of laying these roofs to secure the best results at the least expense. Address our nearest office.

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Especially recommended for use above the ground level on the interior of stone, brick or concrete walls to exclude dampness.
Has superior covering capacity and is vastly superior to other paints in its permanence and resistance to dampness. It penetrates into the pores of the brick so that an accidental abrasion does not break the waterproof seal. Furnishes satisfactory base for plaster and keeps the plaster from injury by dampness in the wall.

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Creosote Shingle Stains
Send for the new free booklet, handsomely printed in colors, showing the beauty of these stains. Very economical and satisfactory.

Special Note—We advise incorporating in plans the full wording of The Barrett Specification, in order to avoid any misunderstanding. If any abbreviated form is desired, however, the following is suggested:
ROOFING—Shall be a Barrett Specification Roof laid as directed in printed Specification, revised August 15, 1911, using the materials specified and subject to the inspection requirement.

BARRETT MANUFACTURING COMPANY

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New York Chicago Philadelphia Boston St. Louis Cleveland Pittsburgh
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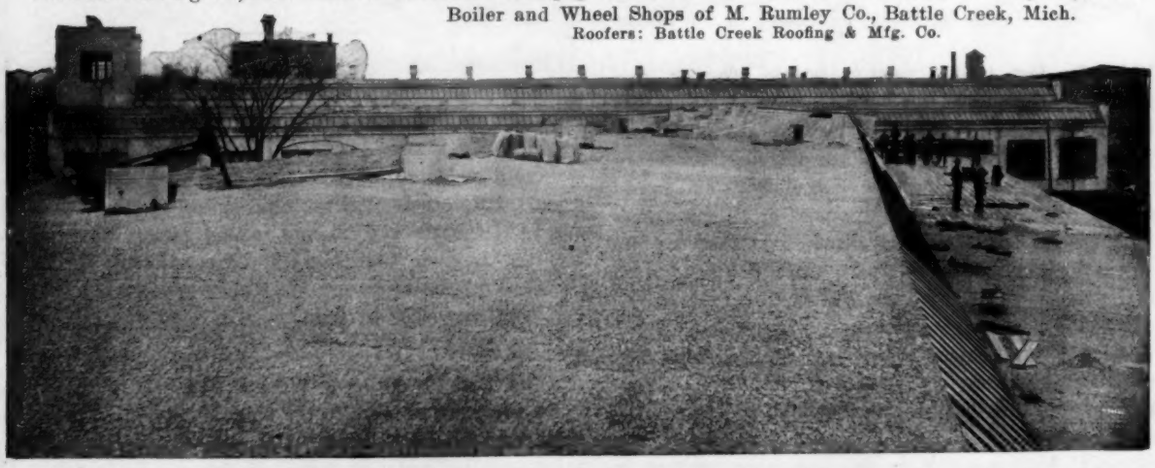
Boiler and Wheel Shops of M. Rumley Co., Battle Creek, Mich.
Roofers: Battle Creek Roofing & Mfg. Co.



tions were opened, the dead rats were found. Outside of one station four rats were found dead around a roadside puddle.

In addition to the cases quoted, Danysz virus has been used on the royal estate, Sandringham, on other properties, on farms, game preserves, etc.; in private houses, stables, kennels, poultry pens, flour mills, breweries and dock yards; in fact, wherever rats have been found troublesome or destructive. On the government farms in Trinidad and elsewhere in the West Indies, in South Africa, Australia and on islands of the Indian and Pacific Oceans it has been found of the greatest value.

In January, 1909, Danysz virus received its introduction to the public of the United States through Benjamin Russell, United States Superintendent of Warehouses for the port of New York. Mr. Russell had heard of the wonderful results accomplished abroad and decided to test the virus. He therefore had the contents of 120 tubes of the virus prepared and distributed through a large warehouse at Beard's Stores, Erie Bason. Ten days later, January 28, 1909, Mr. Russell announced to the press of the United States that the experiment was a complete success.

The success of the Danysz virus in the United States can best be told by some of the users:

L. C. Teller, of Teller's Broadway Theatre, Brooklyn, N. Y.: "It is a modern miracle."

F. X. Baumert & Co., cheese manufacturers: "It is the most effective thing for rat extermination that we have ever seen."

The New Orleans Cold Storage & Warehouses, Ltd., New Orleans, La.: "Danysz virus is most effective."

At Campbell Stores, Hoboken, N. J., one thousand tubes of Danysz virus were used with remarkable results.

The clothing house of A. Raymond, New York, report: "Excellent results."

Many textile mills in Fall River, Mass., are using Danysz virus with most satisfactory results.

CONVENTION NOTES.

The D. D. FELTON BRUSH Co., of Atlanta, were represented at the Isle of Palms convention of the Southern Textile Association by G. B. Snow, one of their traveling men. Mr. Snow was giving out envelopes containing advertising literature, and also the following statement by General Manager James B. Fitch, addressed to the textile mills:

Within the last twelve months certain former employees have made the erroneous statement that we are not engaged in the repair of cotton mill brushes at our Atlanta plant. At this time we wish to place ourselves on record to the effect that we are doing this class of work and would be very glad to mail a list of references or submit prices and mail samples of the various materials that we are using. The quality of our workmanship and the standard of our output is fully covered by the long-established Felton guarantee.

The Charles A. Schieren Company, Manufacturers of "Duxbak" belting, were represented by Edwin G. Weyhausen, who was distributing a souvenir in the form of a watch fob.

William C. Robinson & Sons Co., had representatives in attendance and had taken the trouble to ship an expensive operating exhibit to be shown during the course of the convention, but because of some misunderstanding, no provision had been made to take care of such an exhibit, and it was never opened up. This company manufactures the well known "Slashol" for slashing short and long chain work and finishing.

The Dary Ring Traveler Co., was represented by Charles L. Ashley, of Atlanta, Ga.

W. T. Lane & Bros., manufacturers of canvas baskets at Poughkeepsie, N. Y., had canvas baskets rolling around the verandas and was represented by D. F. Lane of the firm, who was distributing leather bill-folds to the members.

The Victor Shaw Ring Traveler Co., of Providence, R. I., was, as is always the case, ably represented by the popular secretary of the association, A. B. Carter.

The Keever Starch Co., of Columbus, Ohio, was represented through its southern office, managed by James H. Maxwell. Mr. Maxwell personally was present and was ably assisted by J. J. Iler of his office. Mr. Iler was booming Victor Mill Starch by presenting to the members of the association aluminum pocket drinking cups in a neat leather case, calling attention to this well known brand of starch.

The Lunkenheimer Co., had a representative at the convention in the person of C. W. Thrash. Mr. Thrash was distributing a watch charm in the form of a Lunkenheimer Valve to his friends.

The Hawley's Laboratories of Charlotte, N. C., had a representative present distributing advertising pencils.

William M. Bird & Co., Inc., of Charleston, S. C., was represented by L. G. Fales, who not only acted as Chief Assistant to Secretary Carter, but also distributed a very unique and interesting parcel post calculator.

The well known and genial face of Mr. Monte of the Southern Spindle & Flyer Co., of Charlotte, N. C., was once more in evidence and this year he was distributing among the boys a very useful little pocket match box and cigar cutter.

R. E. Buck of Charlotte, represented the Southern office of Arnold, Hoffman and Co., ably assisted by Frank G. North of Atlanta.

The smiling countenance of Robert Bowe of Greenville, representing the Saco-Lowell Shops, not only greeted those who arrived early, but was always to be found ready and waiting with a cordial acknowledgment for each new arrival throughout the whole convention.

It is becoming more and more apparent as time goes on that no one industry in the South is to be allowed to monopolize the use of Ruberoid as a roofing material. THE STANDARD PAINT Co., of New York, the manufacturers of Ruberoid and Kaloroid Roofing, have recently received an order through their southern representative, Mr. Z. G. Scott, for 1,657 squares of Ruberoid roofing for the Santee River Cypress Lumber Company at Ferguson, S. C. These standard brands of roofing are becoming increasingly popular in all branches of industry.

THE BERLIN ANILINE WORKS, 213 Water street, New York City, are sending to the trade a color card describing their Zambesi Black 0BA, 0TA, and 2BA. The card contains samples and full directions for using. A copy may no doubt be secured on application.

RU-BER-OID
PRONOUNCED "RU" AS IN RUBY
ALWAYS SPELLED WITH ONE B.

RU-BER-OID is the original flexible, prepared roofing. Its introduction, in 1892, followed years of experimentation, in which The Standard Paint Company employed the most skilled chemists of America and Germany. This opened a new era.

For the first time a ready-to-lay roofing was offered, which was free from the disadvantages of tar roofings, and which would not run under the most severe heat or crack with extreme cold. Its serviceability is vouched for by the fact that the first RU-BER-OID roofs applied in 1892 are still in good condition, still serviceable and weather-proof.

Critical facts for the Buyer of Roofing

KA-LOR-OID (Colored Ruberoid) came later, and possesses all the enduring characteristics of RU-BER-OID with the added feature of permanent colors worked into the best felt roofing procurable.

We originated, and have kept on improving

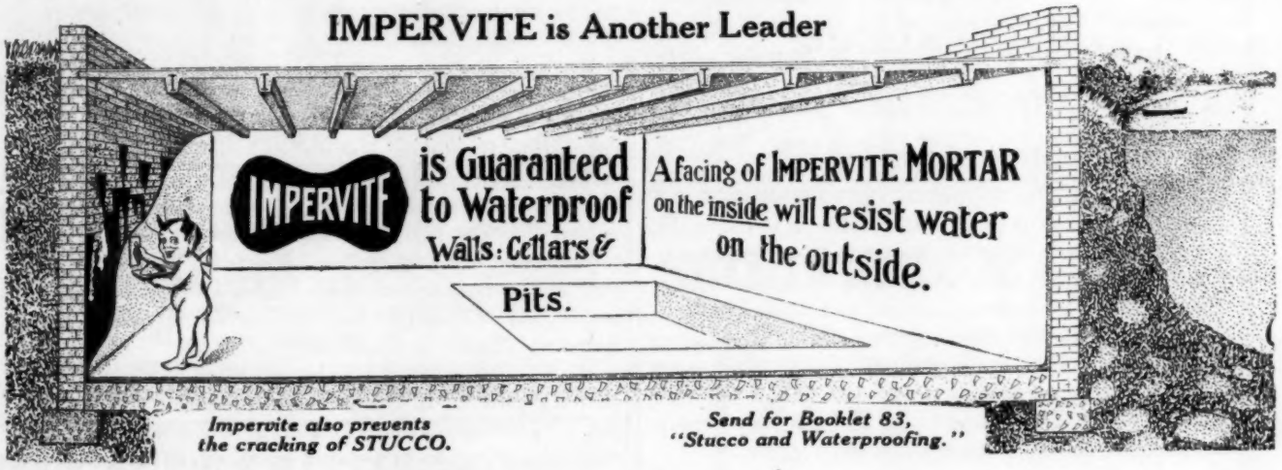
The only secret lies in the process of making RU-BER-OID Gum. This Gum is water-proof and flexible as new rubber. Yet, unlike rubber it retains these qualities when exposed to the elements. Rubber rots after slight exposure. RU-BER-OID and KA-LOR-OID retain their life and flexibility under the severest weather conditions.

RU-BER-OID and KA-LOR-OID (Colored Ruberoid) contain no rubber or tar. They are not "asphalt" roofings. They may be used on roofs from which drinking water is gathered without affecting the water in any way.

They are effective insulators, and exclude both heat and cold. They are fire-resisting. Hot coals thrown on them do not set fire to the roofing or to the sheathing beneath.

A lot of interesting information (with comparisons of various roofings) will be mailed on receipt of postal asking for Book 191.

IMPERVITE is Another Leader


IMPERVITE
is Guaranteed to Waterproof Walls: Cellars & Pits.
A facing of IMPERVITE MORTAR on the inside will resist water on the outside.

Impervite also prevents the cracking of STUCCO.

Send for Booklet 83, "Stucco and Waterproofing."

The Standard Paint Company

The Standard for Two Generations. **New York Boston Chicago**

A PARTIAL VIEW OF THE EXHIBIT OF THE DRAPER COMPANY AT THE FOURTH NATIONAL TEXTILE EXHIBITION.

The recent textile exhibition in Boston of the Textile Exhibitors' Association recorded a success in bringing together the most comprehensive display in textile machinery ever shown in this country, and in all it was visited by thousands of textile people. The advance in the art of weaving was well illustrated when out of thirty-one looms in the exhibition, all but two were automatic. Of these two, one was a hand loom which celebrated its one hundredth birthday some years ago. For those who do not prefer the hand loom of our great-grandmothers, the automatic loom is a necessity. The illustration of the Draper Company's exhibit herewith was taken just before the hour for admission of the public.

THE ARABOL MFG. CO., of 100 William street, New York City, the well-known makers of soluble oils, alizarine assistant, sizing and finishing compounds and other staples which have made them so popular with textile manufacturers, has again been compelled by the increase of business to enlarge its offices by taking almost the entire fourth floor of the Woodbridge Building Annex, and visitors will be pleasantly surprised at the improvement. By breaking through connecting walls, more than double floor space was secured, and all administration departments are now brought together. Also the printing and publicity departments now enjoy very commodious quarters.

William Floyd Lee, chief engineer of C. W. Hunt Co., Inc., West New Brighton, N. Y., at a recent meeting of the board of directors, was elected vice-president and chief engineer of the company.

The series of supplements issued by the CASSELLA COLOR COMPANY to their handsome volume of cotton colors, issued some time ago, is brought up to date with a supplement describing Diamine Green H S Pat., one of the later additions to the well-known series of diamine greens. This product produces full, level shades of green upon cotton, and is adapted to the dyeing of raw stock as well as to yarns and piece goods. This supplement is illustrated with a number of dyeings on cotton and union goods, and contains full dyeing directions. No doubt copies of this card may be obtained upon request made to any of the branches of the Cassella Color Company.

The date and place for the next National Textile Exhibition was not determined upon at the annual meeting of the Textile Exhibitors' Association, Inc., which was held at Ferncroft Inn, Monday, June 8. Atlanta is making a strong bid for the next exhibition. A monster petition with several hundred signatures of southern cotton manufacturers, which was prepared and forwarded by COTTON, was read at the meeting and created much interest, but the directors left the matter open for further investigation by Secretary Chester I. Campbell.

F. H. Bishop, of the Universal Winding Co., was re-elected president; E. F. Hathaway, American Warp Drawing Co., vice-president; Chester I. Campbell, secretary-treasurer. The directors elected are: C. P. Erhard, Stafford Co.; C. F. Hutchins, Crompton & Knowles; L. E. Tracy, L. E. Tracy Co.; C. A. Chase, General Electric Co.; L. W. Campbell, Woonsocket Machine & Press Co.; E. H. Rooney, Whitin Machine Co.; F. H. Bishop, E. F. Hathaway and C. I. Campbell.

GLENLYON DYE WORKS

(Yarn Dept.)

CENTRAL FALLS, R. I.

FRANK A. SAYLES, Lessee

Bleachers and Dyers

OF

Cotton Yarns in Ball-warps and Skeins, Silk and Viscose Silk

SPECIALTIES: COLORS FAST TO BLEACHING, Mercerizing, Laundering, Cross Dyeing and Light. Dyed Novelty Effects in Fast Colors. High Grade Bleaching of Cotton Warps and Skeins. Silk Dyed Fast to Boiling Off and Bleaching.

Insist on Having

"GLENLYON DYED YARNS"

Safest and Most Reliable in the Market.

Write for Shade Card, Information and Guarantee.

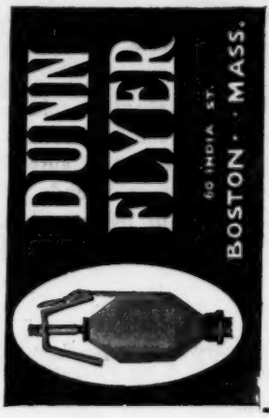
Last a Lifetime

CORTRIGHT Metal Shingles cost no more than good wood shingles, yet they last a lifetime, are rain and storm-proof, wind-tight, fire-resisting, and add greatly to the appearance of any structure.

They have been in successful use for almost thirty years, and many roofs put on twenty and twenty-five years ago are as good as new today.

Our valuable book on roofing sent free upon request. Write for it today.

CORTRIGHT METAL ROOFING CO.
Philadelphia and Chicago



PERFECT BALANCE.
NO CHANGING SLOT.
TWIST RETAINED.
A " DOG DAY" FLYER

MORE AND BETTER ROVING

LESS DOFFING, HANDLING, SETTING IN, PIECINGS AND WASTE.

Costs No More
Makes and Saves You Money.

DUNN FLYER CO.
60 India St., Boston, Mass.

The "1912" Cloth Cutting, Folding and Winding Machine

This machine will cut down operating expenses. It does in one operation the work which is now being done in two. It cuts the cloth, folds the edges and rolls them up in one operation, and at all times gets one more strip out of a bolt of cloth than is possible with the old method of cutting. At the same time it measures the bolt of cloth to show the manufacturer whether or not he is getting the number of yards he is paying for. With the high price of cotton to-day every knit goods manufacturer ought to look into this to see if he is getting the maximum efficiency at the least expense. You will find when you come to figure it up in the course of a year that the labor it saves is a big item.

Also have other labor-saving devices, and upon application you can get prices and full information on same.

J. A. FIRSCHING, 50 John St., Utica, N.Y., U.S.A.

Clinton H. Scovell & Company

Certified Public Accountants
Industrial Engineers

40 Central Street, - - Boston, Mass.

Specialists in Textile Cost Accounting

PUX—The Softener of Merit

If you have never tried Pux Softener, you have overlooked the one softener that always gives entire satisfaction and perfect results. It leaves a fine, heavy finish and clothy feeling, a beautiful silk lustre, and at the same time gives the goods a soft and mellow feel.

Try It—Just Once

STANDARD SOAP CO., - - Camden, N. J.

FOR

SCOURING—WASHING

There is nothing which gives you the soft, harmless, thorough and low-priced results of

Alumina Soapalite

THE MINERAL SOAP

The Electric Smelting & Aluminum Co.
LOCKPORT, N. Y. Sole Manufacturers

DIXIE SPINDLE & FLYER CO., Inc.

Expert Overhaulers and Repairers

COTTON MILL MACHINERY

CHARLOTTE, N. C.

KNITTING MILL NEWS.

Notices of mill projects, additions or improvements are solicited for this department. Other notices pertaining particularly to the Southeastern section will be found in the Southern Mill Situation review.

MASSACHUSETTS.

STOUGHTON. Charles Stretton & Son Co., manufacturers of mens', womens', and children's underwear and union suits, are building a brick addition two stories high to the plant for bleaching and dyeing purposes.

NEW YORK.

AMSTERDAM. The Chalmers Knitting Co., have acquired all of the property of the Gilliland estate, and expect to erect another mill in the near future.

UTICA. A special meeting held here about the middle of the month, practically 75 per cent of the stockholders of the Frisbie & Stanfield Knitting Company gave authorization to the issue of $900,000 in 6 per cent gold bonds. This is the first step in the elaborate plans of the organization with a greater means to carry on the immense business of this company.

OHIO.

CINCINNATI. The Adler Underwear & Hosiery Mfg. Co., deny the report that they are to build an addition on the property recently purchased.

PENNSYLVANIA.

NEW CASTLE. It is reported locally that arrangements have almost been completed for the establishment of a hosiery mill at this place. The proposition will be capitalized at $75,000, over half of which has already been subscribed. It is also rumored that the company will erect and operate its own dye house.

NORRISTOWN. The Phoenix Knitting Co., has not closed down its plant as was recently reported. Fred J. Ash, the superintendent and secretary, announces that the mill has been running full time and is still doing so.

PHILADELPHIA. The plant of the Coatesville Knitting Mill, which was recently incorporated, has started operation. This plant manufactures half hose and running full operation will have a capacity of 2,000 dozen a week.

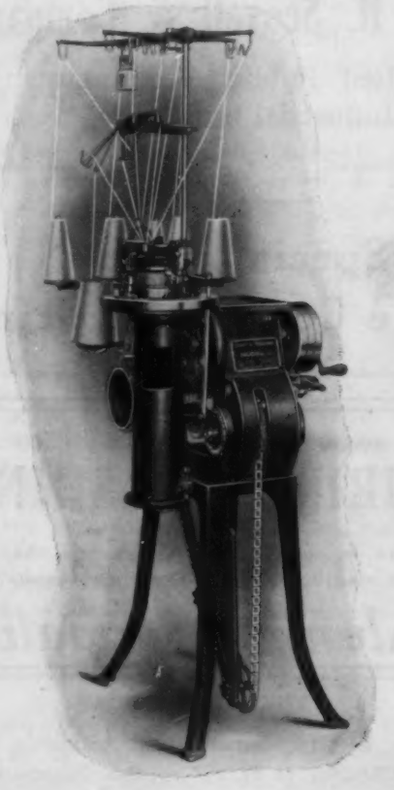
PHILADELPHIA. The Commonwealth Knitting Co., has recently been chartered with a capital of $25,000 by Samuel J. Livingston, and associates. This company now has twenty machines in operation, making plated silk goods a specialty, and later expects to increase its equipment.

RHODE ISLAND.

PROVIDENCE. The New England Hosiery Co., has made an application for articles of incorporation, with capital stated as $10,000. R. B. Leinbach and associates are incorporators.

TEXAS.

NIXON. It is reported that the Mayor of Nixon is interested in securing the establishment of a hosiery mill at that place.



Is there an abundance of skilled labor for topping in your locality? If so, you are fortunate.

If not, you should investigate our Model F machine, which produces half hose without skilled labor at a saving of from 7 to 15c per dozen, and makes women's stockings with a knitted turned welt, dropping both from the machine.

Established 1865

Scott & Williams, Inc.

88 Pearl Street

BOSTON

NEW YORK PHILADELPHIA UTICA

To reduce the cost of production and widen your margin of profit use

Clinchfield Coal

AND

Clinchfield Service

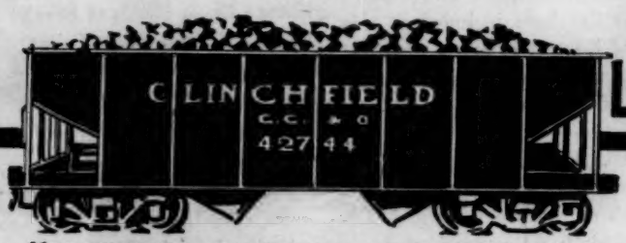
The one, a product of up-to-date mining methods; the other a scientific aid to fuel efficiency.

Mined By

CLINCHFIELD COAL CORPORATION
DANTE, VIRGINIA

Sold By

CLINCHFIELD FUEL COMPANY
SPARTANBURG, S. C.

CLEAN 

LUMPY

"NEVER SHORT OF CARS"

BOOK REVIEWS

All Books Reviewed Under This Heading May Be Procured From COTTON at the Published Price.

THE SCIENCE OF KNITTING. By Ernest Tompkins, M. E., knitting expert for the Wildman Mfg. Co. 830 pages, 5 x 7½ inches. 55 illustrations. 73 tables. Bound in flexible leather, with thin paper pages; gold edges. Price, $3.00 net. Published by John Wiley & Sons Co., 432 Fourth avenue, New York City.

As an illustrated reference book of the elementary principles of knitted fabrics and machine knitting, including fundamental conventions, definitions, rules, formulas and tables, especially arranged for the student, the operator, the manufacturer or the analyst, this book is a most valuable compilation. It is not a description of knitting machinery, nor is it a theory of what knitting should be, but it is a collection of already published articles, many of which are unlikely to be found in any other book on knitting.

Over twenty years of practical experience and observation in many departments of knitting plants, as well as the factory where knitting machinery is manufactured, has given to Mr. Tompkins a wide view point. Readers of COTTON, where many of Mr. Tompkins' articles have been published in years past, well know his habit for concise expressions and his ability to evolve simple rules. In this book tables are given for both rib and loop-wheel machinery, so results may be obtained directly from the tables. It also contains much special information, tabulated and arranged for the convenient use of the practical man.

THE CHEMISTRY OF DYEING. By John K. Wood, D. Sc., Lecturer in Chemistry, University College, Dundee, Scotland. 77 pages. Price, 75 cents net. Published by the D. Van Nostrand Co., 25 Park Place, New York City.

The object of the author in writing this little book has been to give a concise and connected account of the work, which has been carried out particularly during the last thirty years, with the object of throwing light on the nature of the dyeing process. It is a book which should have the effect of widening the student's outlook by showing him that the broad principles which govern many of the operations of the laboratory apply with equal force to a large industry. Such information respecting the textile fibers and dyestuffs as is necessary for a complete understanding of the principles of dyeing has been included in this book. It will no doubt prove of interest to many practical dyers, and will have an effect in arousing in them a greater interest in the theoretical side of their work.

HANDY ATLAS OF THE WORLD. Containing maps of the United States, its 48 states, territories and insular possessions, Dominion of Canada, each of the provinces and foreign countries. Price, bound in cloth, 50 cents; in leather, $1.00. Published by the L. L. Poates Publishing Co., 22 North William street, New York City.

As indicated in the book heading, this new work is fully equipped with maps, 5 by 7 inches in size, of the countries and sections named, and with a complete index of population. All maps are in three colors, water in blue, mountains in relief, and all railroads named. It is a very handy and useful atlas, and occupies little room, either in the desk or the traveling bag.

DOCKHAM'S AMERICAN REPORT AND DIRECTORY OF TEXTILE MANUFACTURE AND THE DRY GOODS TRADE. Twenty-fourth edition. 696 pages. Price, $6.00 Published by the Dockham Publishing Co., 6 Beacon street, Boston, Mass.

The twenty-fourth edition of this well-known directory contains its usual varied assortment of information relative to the textile industry, containing, among other valuable features, the following: An alphabetical list of textile manufacturers, print works, bleachers, dyers and finishers in the United States and Canada; a list of textile associations; a list of cotton dealers in the United States, Canada, Liverpool, Bremen, Havre and Antwerp; a list of cotton exchanges; a list of cotton goods brokers and converters; a list of directors in many of the leading incorporated companies, as well as a list of dry goods commission merchants and agents; other lists include wholesale dry goods men, both in the United States and Canada; exporters, importers, waste dealers and yarn dealers. A number of pages are also devoted to statistics which are both interesting and valuable.

FAN ENGINEERING. Edited by W. H. Carrier. 581 pages, 4¼ by 6¾ inches. Price, $3.00. Published by the Buffalo Forge Co., Buffalo, N. Y.

This book was planned to directly advance engineering knowledge as applied to the industrial properties and industrial handling of air. It is bound in flexible leather and thoroughly indexed and cross indexed. It is really a fan engineering reference book, inasmuch as it contains about 400 pages of tables, charts and nearly 200 pages of text. It contains chapters on properties of air, the application of air for various purposes, methods of conducting air, apparatus for producing air under pressure, etc., and methods of driving such apparatus. Another section shows practical applications and data for the selection of apparatus. It will no doubt be well received by the engineering trade, who have long desired a handy reference book pertaining to this interesting subject.

THE BAYER COMPANY, INC., 117 Hudson street, New York City, are sending to the trade the following color cards: Diamond Black P. G. Extra; Benzoform Scarlet B; Katigen Green K. F. Extra and Katigen Deep Green K Extra; Diazo Brilliant Scarlet S. B.; Diazo Brilliant Scarlet S. 4 B., and Diazo Brilliant Scarlet S. 8 B. These color cards contain full descriptions of their respective dyes and may be secured on application by parties interested.

THE LINK-BELT COMPANY, Chicago, Ill., has recently issued a new booklet, entitled "Book No. 195," illustrating newspaper conveyors. This book is printed on coated paper and handsomely illustrated, showing Link-Belt conveyors in newspaper and magazine offices in different parts of the country. It is a very interesting booklet, showing, as it does, the development of conveying machinery along special types of work, and indicates the possibilities of this class of machinery in many other lines of work.